

Review and
War Progress
Number

FEBRUARY 1943

COAL AGE

McGraw-Hill Publishing Company, Inc.

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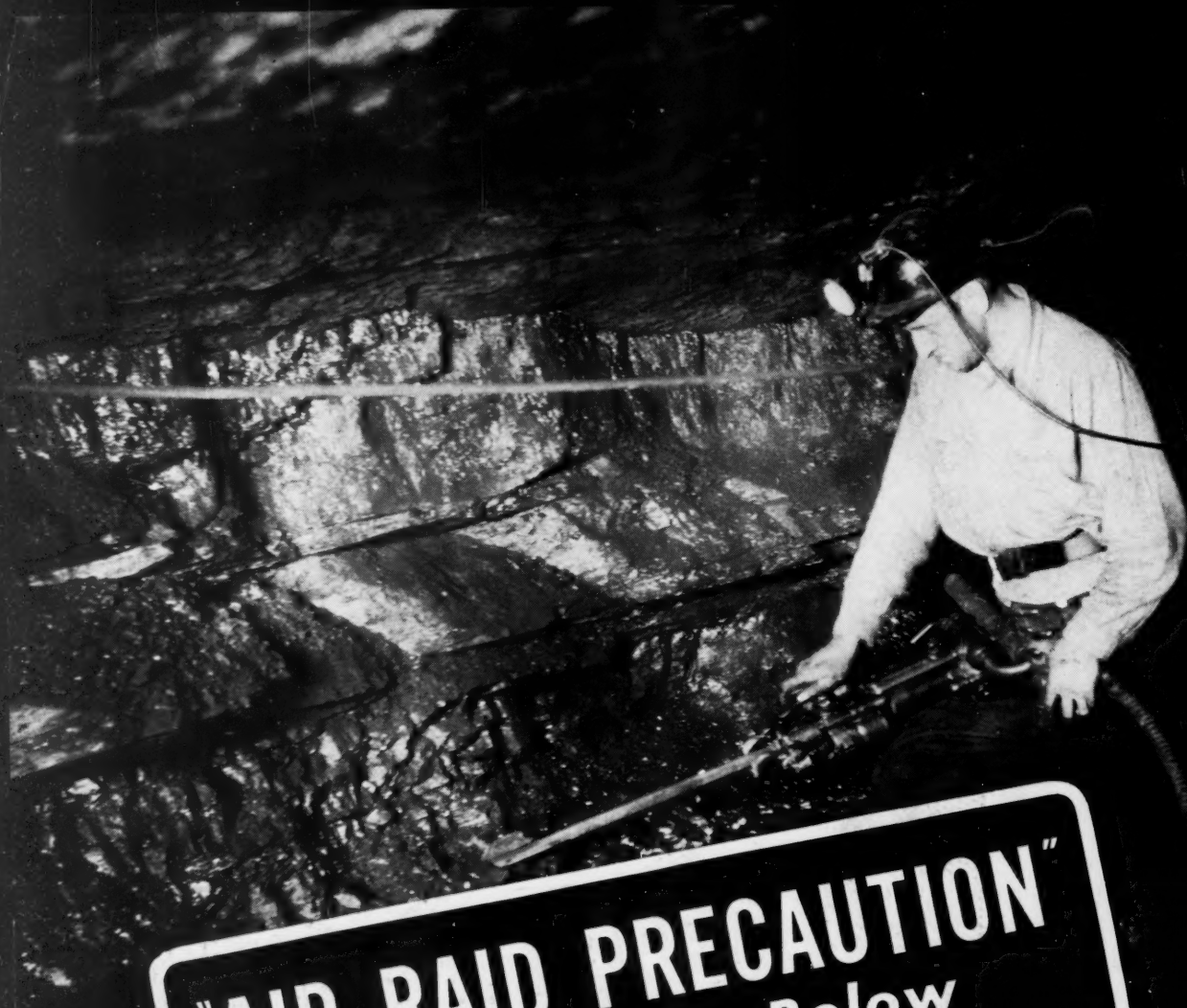
WAR ENERGY — 1942, 640,000,000 TONS
1943 Goal, 665,000,000 TONS

In This Issue:

How Coal Coordinated Men, Management
and Materials to Reach the 1942 Goal • A
Look at the Future in Mining and Prepara-
tion, Safety, Manpower, Materials and
New or Increased Uses for Coal

Complete Table of Contents, P. 5





"AIR RAID PRECAUTION"
...1200 Feet Below

SUN MINE LUBRICANTS

Keep Air Compressors on the Job ... Eliminate Sticky Valves

No war job in the country is more important than that being done so efficiently by the Anthracite Coal Industry in meeting the threat to America's health and war effort created by the critical shortage of other fuels. Getting out the coal is vital on the home front and the fighting front.

In one of the largest anthracite mines trouble developed more than a year ago in their air compressors. Sticky deposits on the unloader valves caused frequent shutdowns for cleaning. A Sun Oil Engineer—one of those Doctors of Industry—

was called in. His analysis and recommendations resulted in a switch from competitive oils to Sun Lubricants. Trouble vanished and valves have not stuck since then.

Such service is an everyday occurrence for Sun Doctors of Industry and Sun Lubricants. Whatever your lubrication problems may be, feel free to call in a Sun Engineer. Don't permit faulty lubrication to hamper all-out production of the coal that is vital to victory! Write....

SUN OIL COMPANY, Philadelphia

Sun Oil Company, Limited, Toronto, Canada

SUN PETROLEUM PRODUCTS



HELPING INDUSTRY

HELP AMERICA

If conveyor power cost is high— your belts may need attention

Power required to drive a conveyor is we believe the best guide to the condition of the entire conveyor system including the belt. Misalignment of carriers, lack of adequate lubrication, failure of bearings, incorrect spacing of carriers, excessive sag,

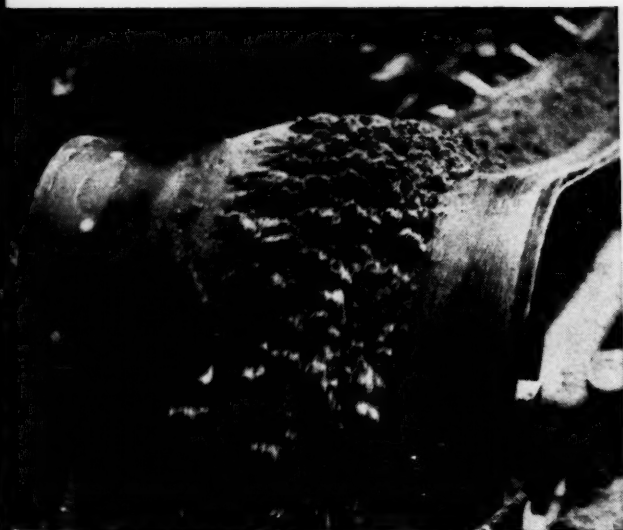
worn belts—all these are reflected in power cost. Correct those that are wrong, and power is saved and rubber and metal vital to the war effort are conserved. In many cases belts containing tons of rubber have been made to last twice as long as formerly.



Avoid misalignment of carriers



Avoid defective idlers



Avoid excessive sag



Avoid worn belts—get them repaired

B. F. Goodrich offers service to save both power and rubber

B. F. Goodrich engineers will be glad to work with yours toward saving power, rubber and metal. The B. F. Goodrich belt repair system is one of the important services we can offer you. Tears, gouges, worn edges of conveyor belts can be repaired on the job, and the belting kept in good operating

condition longer, with less wear on the system and so less power required.

These repairs are made quickly by trained men using portable electric vulcanizers. Most B. F. Goodrich distributors are equipped to render this service. Call the one nearest you or write us for his address. Help save

rubber, power, metal, time and money—all vital to the war. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*



B. F. Goodrich

FIRST IN RUBBER

KILL FRICTION DEVILS W



★ ★ **F**OR MANY YEARS
Hulburt Quality Grease has waged war
on the friction devils or "gremlins" that
lurk in coal mine equipment. Since most
of today's equipment will have to last out
the duration—it becomes imperative that
friction "devils" be liquidated down in
the mine, in the preparation plant—where-
ever they are found. Call in a Hulburt
Lubrication Engineer to help you—and
remember that Hulburt Quality Grease is
the only lubricant made exclusively for
coal mine equipment.

HULBURT OIL & GREASE COMPANY

Specialists in Coal Mine Lubrication

PHILADELPHIA . . . PENNSYLVANIA



HULBURT

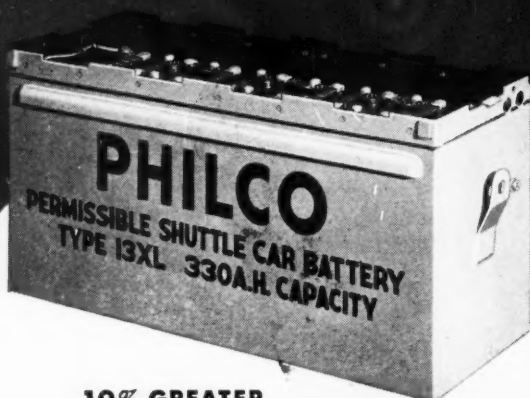
S WITH **HULBURT**



QUALITY GREASE

Haul 10% More Coal Between Charges—

WITH POWER
XL STORAGE BATTERY



10% GREATER CAPACITY . . . SUSTAINED HIGH VOLTAGE . . . LONG PRODUCTIVE LIFE

- Philco oversize grid and Philco engineering developments give you a positive 10% greater capacity.
- Philco rugged Construction keeps maintenance costs at a minimum.
- Philco "K" Process produces a flint-hard plate of exceptional porosity with superior bond between material and grid.
- Philco Triple Insulation adds months of dependable service by "sealing" the active material into the grid with Glass Fibre Mats . . . Slotted Rubber Retainers . . . rugged Separators.

With Philco XL Storage Batteries in your Joy Shuttle Cars or mine locomotives you can keep going 10% longer between charges! Philco gives you 10% greater capacity . . . with sustained high voltage, hour after hour!

Philco's 50 years of practical experience and intensive development work bring you a battery with reserve power . . . long productive life . . . extra wallop for long hours of service . . . minimum maintenance costs!

And because our production facilities have been *tripled* you can now get Philco batteries in half the time that is current practice in the industry! Specify Philco!

Just out! New catalog of Philco Shuttle Car and Mine Locomotive Batteries. Write for your copy today. Philco Storage Battery Division, Dept. C, Trenton, N. J.

PHILCO STORAGE BATTERIES—
DEPENDABLE MOTIVE POWER
FOR JOY SHUTTLE CARS AND
MINE LOCOMOTIVES.



PHILCO Storage Batteries



COAL AGE

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Please change my address on Coal Age

From
To
Signed

PROGRAM NOTES—COMING ATTRACTIONS

• HOW COAL filled the bill in 1942 and a look at some of its future prospects are the themes of this Annual Review and War Progress number of Coal Age. First, it might be asked, how did coal fare in comparison with other fuels in 1942? Second, did it meet all demands for its own product? The answer is that it did. The details on these and other pertinent questions are the subject of the review article starting on p. 68 and heading up the review material.

• Equipment, materials and manpower are among the leading problems of the industry. To throw light on these questions, J. L. G. Weysser, of the War Production Board, contributes a review of priorities developments in 1942, with some hints as to the shape of the future (p. 79), while Brig.-Gen. Frank J. McSherry, War Manpower Commission, sketches the overall manpower problem and makes several recommendations for coal, including a longer work week (p. 82).

• Were many new mines opened in 1942 in response to war-time demand? Again evidence indicates that the answer is no, compared with the activity marking developments in the last war. New openings were held down to the needs for special coals and to fill the requirements of certain consumers and regions; this to save materials and prevent building up capacity to be liquidated after the present war. A

**BUY
WAR
BONDS**

**THE BROWN-FAYRO
COMPANY**
JOHNSTOWN, PA.

**BUY
MORE
BONDS**

"BROWNIE" QUALITY MINE EQUIPMENT DESIGNED FOR TODAY'S PEAK PRODUCTION

The girl operators and their
chiefs and supervisors in this
mine the heaviest burden in this
country. At the ex-

Terminal.

Carol singing in Reading Ter-
minal is a novel feature of the
mine's observance of Christ-

War Task.

On the dark tresses of Mary A.
Bawerzski, carefully entrap-
ped in a net, a mine woman who
with other mine women who
share the home of the mine
shares the home of the mine
shares the home of the mine

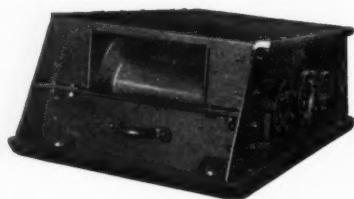
party at Philon the other night three long years ago they're like
he was pretty chummy about members of one big family. May
who'd gone 36 months without was MC. After Joe had led off with some
a disabling accident got back. Most to Joe Lagore, safety leader, and
the boys three years ago without an accident. The Office of Civilian Defense
who group, he turned the mine over announced that since dis-
most to Joe Lagore, chairman of the safe-
ty committee.
Then Joe Traneuse took over
again and the fun got fast and

Quick Blockout.

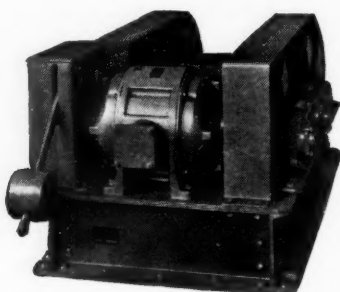
Festive lights are to be permit-
ted to brighten Philadelphia
homes and lawns during
the Christmas season as usual.
The Office of Civilian Defense
announced that since dis-
cussions will not be enforced
in the city until after the first
of the year, outdoor Christmas lights
may shine unobstructed.

Big Plans to Close.
Firms which have announced
a holiday for the majority of
workers on Christmas include
the Baldwin Locomotive Works,
Philo Corporation, Autocar
Company, Camp Shipbuilding
Company, Lehigh Coal and Nav-
igation Company.
Among bonuses announced in
the Scranton Products
plant of the Scranton of m-

home over Christmas and New
Years so travel facilities already
cut by Government movements of
troops will be available for men
on furlough. The same message
has reached millions of home-
goers by way of screen shorts.
To spread facilities the running
Millions for Defense. By Jan-
uary 1, 1943, the Pennsylvania
Railroad stockholders, along with dividend
holders, last week received word
that extraordinary war expendi-
tures, cost their road nearly
\$500,000,000 between August 31,
1939, and October 1, 1942.
War traffic needs, especially
freight, came first. Hence pas-
senger and their needs get con-
sideration from the emergency
to purchase
passenger
cars, motor
cars, and
passenger
cars.



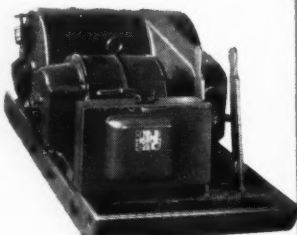
**HKM CAR
SPOTTING HOIST**



HKG LAYER LOADING HOIST



BC4 TUBING BLOWER



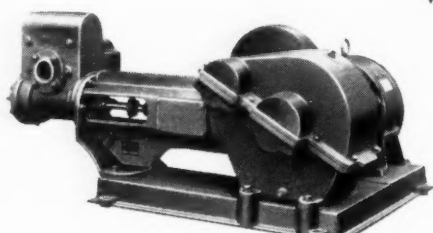
**HGD PORTABLE
AUXILIARY HOIST**

To accelerate your war ef-
fort . . . use these quality
built units in your mine.

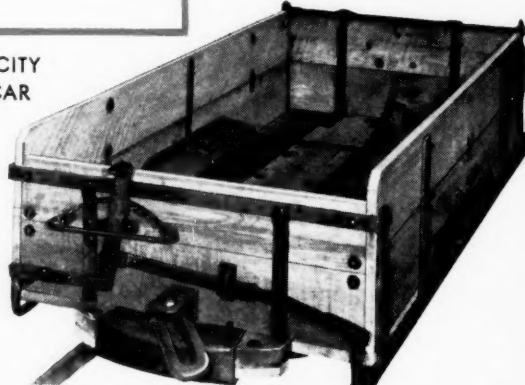
Each one is designed to
Carry the Load to meet
today's peak production
schedules.



**RD ELECTRIC
CAR RETARDER**



**5 x 6 MINE
GATHERING PUMP**



**A HIGH CAPACITY
WOOD MINE CAR**

quick summary of the new-mine picture in 1942 in the bituminous industry is given on p. 84.

- Although equipment sales were down, due to war-time policies, 1942 nevertheless was a year of solid achievements in improving operating practices. Anthracite progress in deep mining, stripping, preparation and related subjects is discussed starting on p. 74. Sales of mechanical loading and cleaning equipment and advances in both these fields are summarized by W. H. Young, R. L. Anderson, G. A. Lamb and John W. Buch (p. 86).

- How bituminous coal used its mechanical-mining equipment, with comments on developments in practice, are reviewed starting on p. 91. This material is buttressed by a summary of advances in auxiliary and service activities (p. 95). Bituminous stripping gets its innings beginning on p. 88; preparation and mechanical cleaning, p. 98; and power and maintenance, characterized by speedier adoption of new war-time practices which bid fair to become permanent, p. 101.

- Safety in coal mining, with analyses of the history of fatalities by principal causes in 1941 and '42, is reviewed by W. W. Adams (p. 105), while Dr. R. R. Sayers, also of the Bureau of Mines, details the accomplishments of federal inspection in 1942 (p. 107).

- What coal will do in the future depends upon the study it gives to the problem today. Research, therefore, attracted greater attention in 1942, although the number of projects was less. The outlook for coal in supplying liquid fuels, coke and by-products is briefed by A. C. Fieldner, of the Bureau of Mines (p. 109), while Coal Age's review of research work in 1942 begins on p. 111.

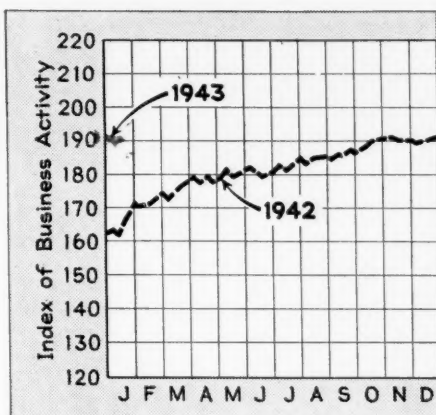
- Training instructors to train new men for coal mining is the subject of an article on the fire for the future. How it actually is done is a highlight of the treatise. Stripping and preparation practices at one of the latest big new properties in Illinois are other matters on the agenda for coming issues.

- Maintenance, along with other topics, also ranks high, with articles on both the subject in general and on shop operation and metallizing in particular on hand. Mining with shaker conveyors and duckbills and a description of operating and preparation practices at a new mine in southern West Virginia also will find a place in early issues.

HOW'S BUSINESS?

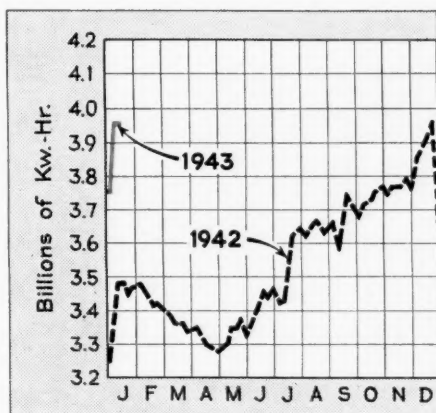
GENERAL BUSINESS CONDITIONS

Besides a growing production bottleneck, the expanding shadow of a rubber crisis by summer and a 19,000,000-ton cargo ship goal for 1943 are the domestic motifs sharing interest with the headlines announcing important Allied war gains, according to *Business Week*. The labor unrest in the anthracite field, of course, has increased the complexity of the situation, with President Roosevelt finding the master-minding task in his lap. *Business Week* Index was at 192.0 for the week ended Jan. 16, compared with 190.9 the preceding week and 191.0 a month earlier.



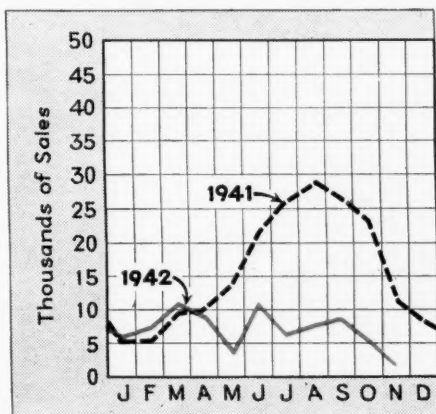
ELECTRIC POWER OUTPUT

Production of electric energy by the electric light and power industry during the week ended Jan. 16 showed only a minor fractional decline from the preceding week—3,952,479,000 kw.-hr., as compared to 3,952,587,000—according to the Edison Electric Institute. The percentage of gain over last year, however, increased from 13.8 for the Jan. 9 week to 14.5 for the following week. Consumption figures for other recent weeks are: Dec. 19, 3,976,000,000 kw.-hr.; Dec. 26, 3,656,000,000; Jan. 2, 3,780,000,000 kw.-hr.



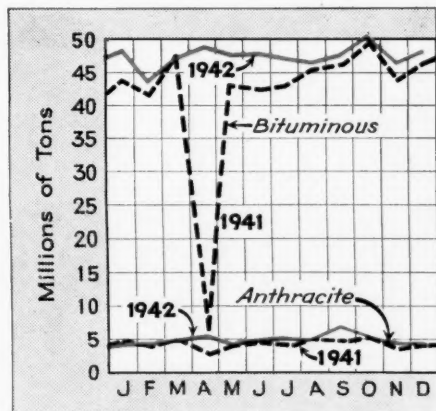
COAL STOKER SALES

Sales of mechanical coal stokers in the United States in November last totaled 2,448 units (U. S. Bureau of the Census from 85 manufacturers, only 49 of whom reported sales during the month), compared with 5,986 in the preceding month and 10,877 in November, 1941. Sales of small units in November last were: Class 1 (under 61 lb. of coal per hour), 1,252 (bituminous, 932; anthracite, 320); Class 2 (61-100 lb. per hour), 312 (bituminous, 289; anthracite, 23); Class 3 (101-300 lb. per hour), 430.

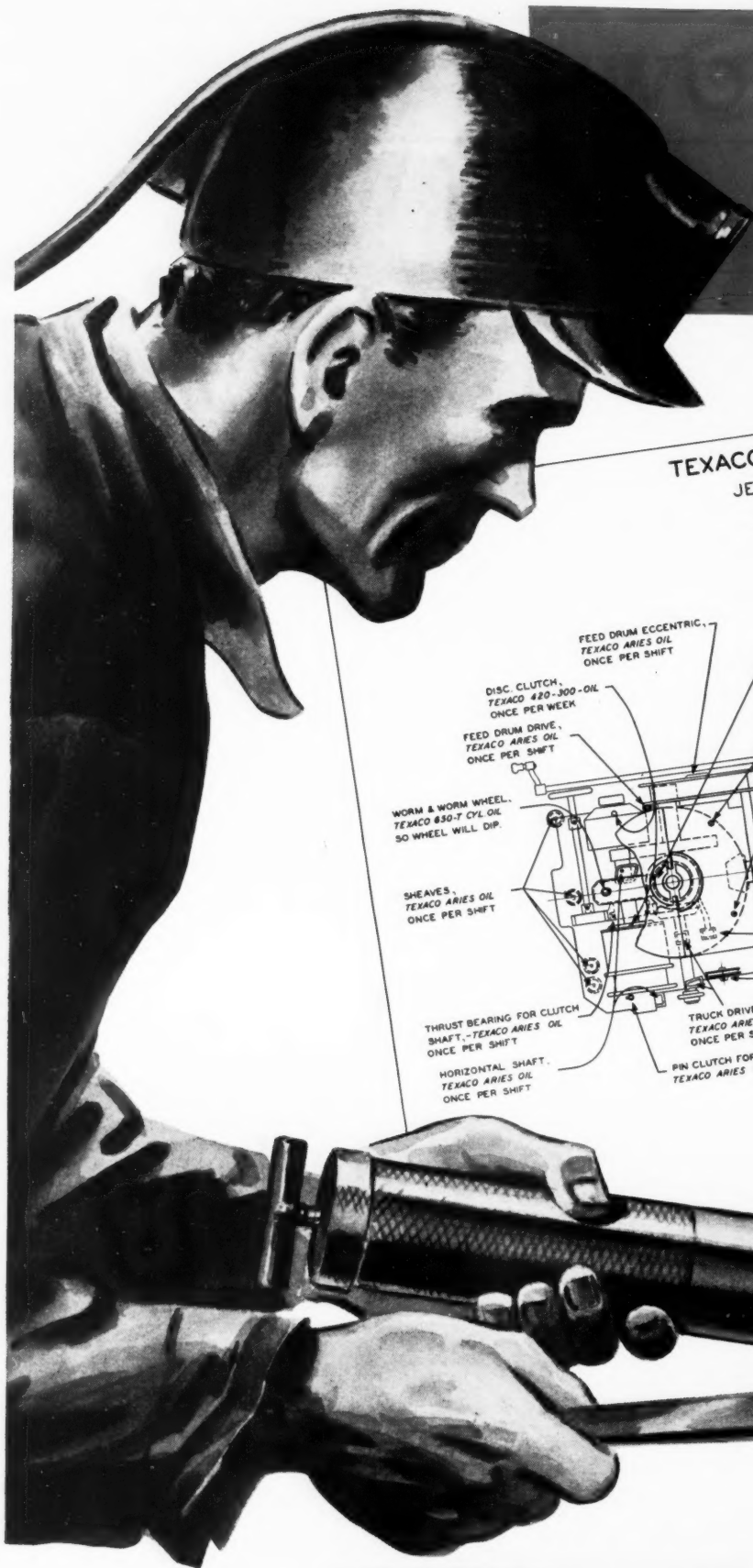


COAL PRODUCTION

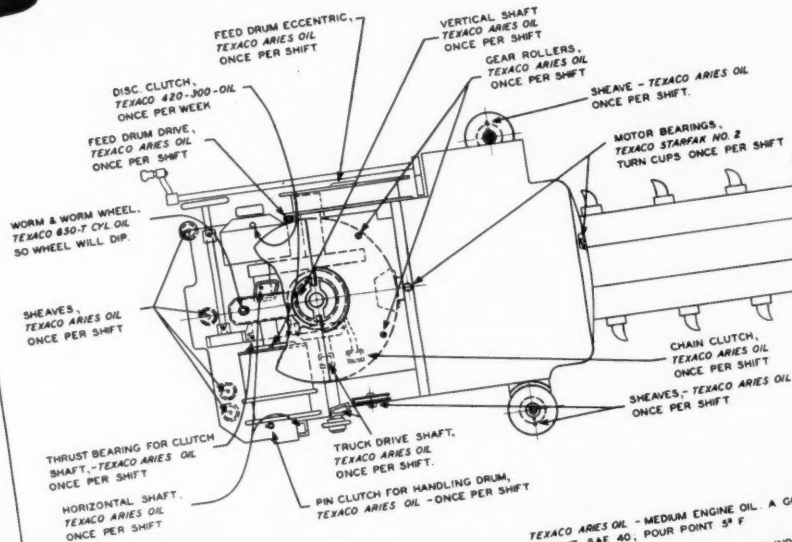
Bituminous coal produced by United States mines in December last (preliminary) totaled 48,400,000 net tons, according to the Bituminous Coal Division, U. S. Department of the Interior. This compares with an output of 47,350,000 tons (revised) in the preceding month and 48,694,000 tons in December, 1941. Anthracite tonnage in December last (preliminary), according to the U. S. Bureau of Mines, was 4,611,000 as against 4,795,000 in the preceding month and 4,271,000 tons in December, 1941.



Your Key



TEXACO MAINTENANCE LUBRICATION CHART JEFFREY "SHORTWALL" COAL CUTTING MACHINE CLASS 35-B AND 35-BB



TEXACO ARIES OIL - MEDIUM ENGINE OIL. A GOOD GRADE OF ENGINE OIL, ABOUT SAE 40, POUR POINT 5° F.
TEXACO 850-T CYLINDER OIL - STEAM CYLINDER OIL. A COMPOUND STEAM CYLINDER OIL, CONTAINING 5 TO 10% ACIDLESS TALLOW, HAVING A VISCOSITY OF ABOUT 150 SECONDS AT 210° F. FOR WORM GEARING.

NOTE: REMOVE COVER ONCE PER SHIFT.



TEXACO

...to Greater Tonnage

LUBRICATION CHARTS

WITH the Federal Government looking ahead to a 1943 increase of some 45,000,000 tons over the all-time high of 1942, *maintenance* of coal-mining equipment becomes the industry's biggest war production problem.

To keep this equipment at work, it *must* be lubricated regularly. As a practical aid to the proper selection and application of lubricants for cutters, loaders, locomotives, we offer *Texaco Maintenance Lubrication Charts*.

Developed in cooperation with the engineering staffs of prominent equipment makers, Texaco Lubrication Charts (12" x 18" in size) show at a glance exactly *where, when* and with *what* lubricant to service each and every lubrication point of your cutters, loaders, locomotives...with lubricants approved by the manufacturer.

Texaco Charts at all lubricating stations for your men to follow, will assure maximum service life, less time out for repairs. Order by make and model from—

The Texas Company, *National Sales Division*,
Dept. C, 135 East 42nd Street, New York, N. Y.

FULL-SIZE 12" x 18" Charts are available for prominent makes of underground machinery. Order yours by *make* and *model* today.

Lubricants

FOR THE COAL
MINING INDUSTRY

SAFE WAYS IN WAR PRODUCTION



NEW WORKER—Every new employee in a Bethlehem Plant wears this button. It helps to fix his attention on safety. It signals to more experienced employees that he is new to the plant, and they keep an eye on him, and do not hesitate to offer friendly guidance in case he forgets instructions and unknowingly breaks any safety regulation.

Industrial accidents, bad enough because of the human distress they cause, are also a grievous drag on production. Every day that injury lays up a worker means lowered output of the materials our armed forces are asking for.

Safety engineers know they must be more than ever on guard as pressure for production intensifies and men work against time. When war came, Bethlehem Steel Company expanded its accident-prevention program to meet the new conditions. Special efforts were addressed to the new employee to make him safety-conscious from the moment he walked into the plant. And by posters, group meetings and individual instruction, the safe way of doing his job was ground into the subconscious of new Bethlehem employee and veteran alike.

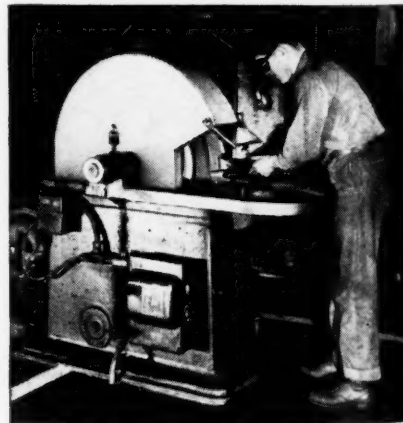
Significant are the results of a current study, showing that of all disabling accidents to Bethlehem employees less than one-third occur in the course of their work. Even with employment rolls upped by the tens of thousands and plant operations at top speed to meet the demands of the war program, the Bethlehem employee is safest, best protected against injury, during the hours he spends on the job.



AUTOMATIC HAND GUARD—This man is operating a trimming press. If he should absent-mindedly let his hands move too near the danger zone, the two cables will automatically whisk them back to safety, before the ram of the press descends.



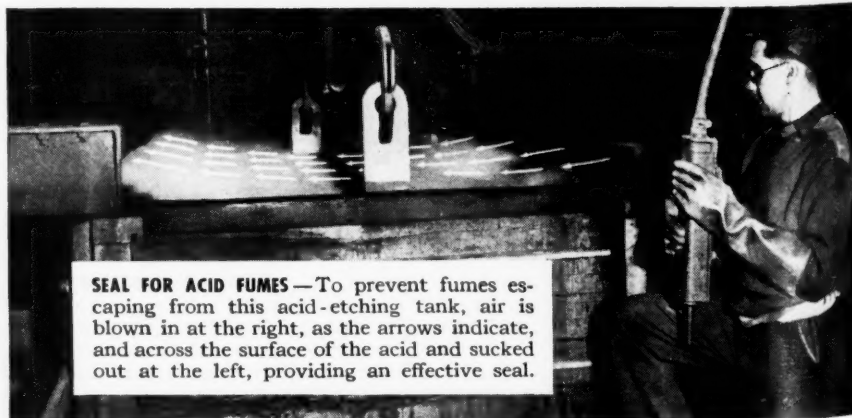
100% HEAT-INSULATED—Asbestos-covered hood, chrome-leather full-length apron, chrome-leather gloves, chrome-leather full-length sleeves and asbestos guard on torch handle give this worker complete protection against heat and flying sparks.



EYES DOUBLY GUARDED—Even though this grinder is equipped with a heavy glass shield, the eyes of the man who is operating it are given further protection against sparks or flying bits of abrasive by the cup goggles that he is wearing.



Bethlehem Steel Company is actively supporting the National Safety Council in its campaign against accidents in war production, through the War Production Fund to Conserve Manpower.



SEAL FOR ACID FUMES—To prevent fumes escaping from this acid-etching tank, air is blown in at the right, as the arrows indicate, and across the surface of the acid and sucked out at the left, providing an effective seal.

665,000,000 TONS

1943 COAL TONNAGE

WAR PRODUCTION

FOR VICTORY

AMERICAN
CYANAMID & CHEMICAL CORPORATION

EXPLOSIVES

"WE MUST - WE CAN - WE WILL!"

THE GOAL set by governmental authorities for the coal mining industry presents a problem which will tax the facilities and personnel of this great industry. Both operators and miners have accepted this task.

To attain this goal explosives will play a vitally essential role. Good blasting practice and selecting the correct permissible will enable equipment to operate at peak capacity with minimum maintenance.

AMERICAN explosives and blasting supplies are fitted for this task. They are products of intensive research, proper chemical control and thorough inspection in the course of manufacture. Capable technical service men are available to assist you with your blasting problems.

- ★ **HIGH EXPLOSIVES**
- ★ **PERMISSIBLES**
- ★ **BLASTING POWDER**
- ★ **BLASTING ACCESSORIES**

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company



30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

EXPLOSIVES DEPARTMENT

SALES OFFICES: Pittsburgh, Pa. Bluefield, West Va. Scranton, Pa. St. Louis, Mo. Chicago, Ill.
Pottsville, Pa. Hazleton, Pa. Maynard, Mass.

-S-s-s-t!-gotta minute Mister?



★ We know you're busy but listen. Some day the sweetest sight to your eyes will be the constant even flow of S-D "Automatic" trains of coal coming out of your mine—the answer to top tonnage.

Now, don't just take a glance, but study carefully, the illustrations in this ad from top to bottom. Not particularly the cars but their action. First, let's look at top illustration. Now, bear in mind that this string of S-D "Automatic" cars never stops rolling after it leaves the mine until the cars return empty; and they'll pass another trip on their return to the mine.

Next, you see how S-D 1-2-3 "Automatics" lay the coal down gently, while in motion, one door at a time, without breaking the coal. This action is taking place in the third illustration—a full train in motion, discharging its coal—20 car loads a minute. The fourth illustration shows how your bin can be filled level full (possible only with "Automatics") when, for any reason, screening or cleaning plant is down.

Here you have the simple story of the most sensible guarantee for top production, minimum man power, at the least possible cost per ton. Reduced costs are certain. So certain, that we are willing to rent S-D "Automatics" to you on a basis so liberal that your cash savings will more than pay the rentals. After these savings have been proved, you may purchase the cars if you wish. You can't lose. Why hesitate? Write for full details now.

Sanford-Day Iron Works
KNOXVILLE TENNESSEE

NOTHING LIKE IT FOR TOUGH V DRIVES!

The New GOOD YEAR STEEL CABLE V-BELT

**tackles forbidden fields
on "belt eater" drives**

SCORE another first for Goodyear—a revolutionary improvement in V-belt construction that obsoletes previous conceptions of V-drive design limitations.

The higher power capacity of steel cables now makes it possible to employ Multi-V drives where engineering limitations formerly denied their use. You can now pull heavier loads or get longer life on your present drives. It makes it practical for you to go to slower speeds or design a more compact drive, often eliminating out-board bearings.

In addition practically zero stretch means a new absolute minimum in adjustment and maintenance shut-downs. This freedom from stretch insures truly uniform performance from every belt in the drive. Once matched, always matched—there can be no loafers. This means far longer belt life.

Proved In Action

An endless steel cable replaces conventional cotton cord as the load carrying member in this remarkable new V-belt recently perfected by Goodyear after years of experimental work. In checking hundreds of thousands of drives for E-C Cotton Cord V-Belts the G.T.M.—Goodyear Technical Man—found many drives incapable of being handled by conventional belts. Many of these drives now may enjoy wire V-belt advantages.

On fan and pump drives of U. S. Army tanks and combat cars where ordinary V-belts "burn out" in a few hours, the new Goodyear Endless Steel Cable V-Belt takes the grueling punishment with a margin of safety. In industry, handling "belt eater" drives, it is proved that this new belt is far superior to any belt ever designed.

Goodyear Steel Cable V-Belts are now available to war industries holding top priority. Present emergency naturally limits the quantity and type, but if you have a troublesome drive, consult the G.T.M. or write the complete story to Goodyear, Akron, Ohio, for information.

E-C Cord—T. M. The Goodyear Tire & Rubber Company

**MORE STRENGTH
LESS STRETCH
BETTER FLEX**

**GM-Specified GOODYEAR ENDLESS STEEL CABLE V-BELT
for Multi-V Drives**

1. Heavy, super-tough black cover with uniform friction, longer life
2. Load-carrying, endless, steel cables in neutral plane
3. Tension and compression sections of high-quality rubber

GOOD YEAR
THE GREATEST NAME IN RUBBER

Why PREforming Conserves Steel, Makes Wire Rope Last Longer

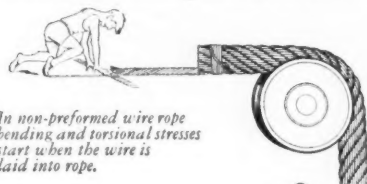
(Note: More and more wire rope users change to PREformed rope each year. During peacetime the reasons for changing from ordinary to PREformed wire rope were primarily two: the cost is lower; PREformed is easier to handle.)

Today, with our nation at war and with steel at a premium, there is another and most important reason for using PRE-formed. It lasts much longer under high speed, severe bending and continuous operation. PREforming thus conserves steel. It conserves workmen's time; rope changes are less frequent. It reduces the accident potential; there is no wickering to harm hands or damage sheaves.)

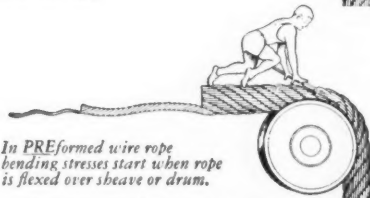
There are two kinds of wire rope.* One is called Regular, or ordinary, wire rope. The other is known as PREformed.

In ordinary rope wires are held together under tension. The wires are laid into the rope by bending them to the desired shape. Bending and torsional stresses thus remain in the rope . . . are kept under control by seizing the ends of the rope.

If the wire breaks, it immediately wickers. If the seizing breaks, the strands



In non-preformed wire rope bending and torsional stresses start when the wire is laid into rope.



In PREformed wire rope bending stresses start when rope is flexed over sheave or drum.

and rope wire both wicker. This causes damage and delay. In PREformed wire rope, the strands and wires are pre-shaped to the exact curvature they will

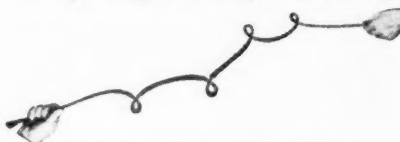
take in the finished rope. Bending and torsional stresses are eliminated (except of course when the rope bends over a sheave). If a wire breaks, it does not wicker but remains relaxed, thus causing no delay or damage.

Advantages of PREforming

PREformed wire ropes are like shoes that have been broken in. Instead of being stiff and unwieldy, they are flexible, easier to handle.

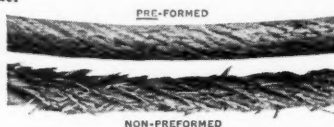


They are better adapted to bending and spooling, also. They resist kinking



when the rope is not under load.

PREformed wire ropes are easier to handle also because broken wires lay flat.



And finally, most important, PRE-formed wire ropes have greater resistance to bending and fatigue. This is



another way of saying that they last much longer, do a better job when the pressure is on, as it is today in war production.

When next you need wire rope, consider seriously the purchase of PRE-formed wire rope. Today the job we must all do is the "best" job possible. When it comes to wire rope there is no question as to which does the "best" job. It's PREformed.

Consult with Macwhyte

Don't overlook the help that Macwhyte engineers will gladly give you on any wire rope problem. Their advice gained from many years' work on all kinds of jobs is yours for the asking. Let us know the kind of work to be done; we will tell you the rope best suited for the job.

And this we urge you to do: take extra care of your present ropes. Inspect them regularly; lubricate them often. By so doing you can make them last longer and thus aid the war effort. That's what you want; that's what your country asks of you.

This is Number 13 in a series of informative articles prepared by the Macwhyte Company to help wire rope users obtain better and longer service from ropes on the job. All articles in this series are available on request.

**MONARCH Whyte Strand
PRE-FORMED WIRE ROPE**

... Macwhyte premier wire rope, famous for its strength, toughness, and internal lubrication.

MACWHYTE COMPANY

WIRE

ROPE

2940 FOURTEENTH AVE.

KENOSHA, WISCONSIN



Manufacturers of MACWHYTE PREformed and Internally Lubricated Wire Rope MONARCH WHYTE STRAND Wire Rope
MACWHYTE Special Traction Elevator Cable MACWHYTE Braided Wire Rope Slings MACWHYTE Aircraft Cables and Tie-Rods

AWARD



WE have a deep feeling of pride that the record of greatly augmented output of our product—used in equipping hundreds of war and defense projects—and the faithful cooperation of our employees merited the Army and Navy "E" Award. It inspires us with a deeper responsibility for continued accomplishment.

WEIR KILBY CORPORATION

Railway Track Work • Frogs • Switches • Crossings, etc.

CINCINNATI

January 13, 1943



BREAK THROUGH

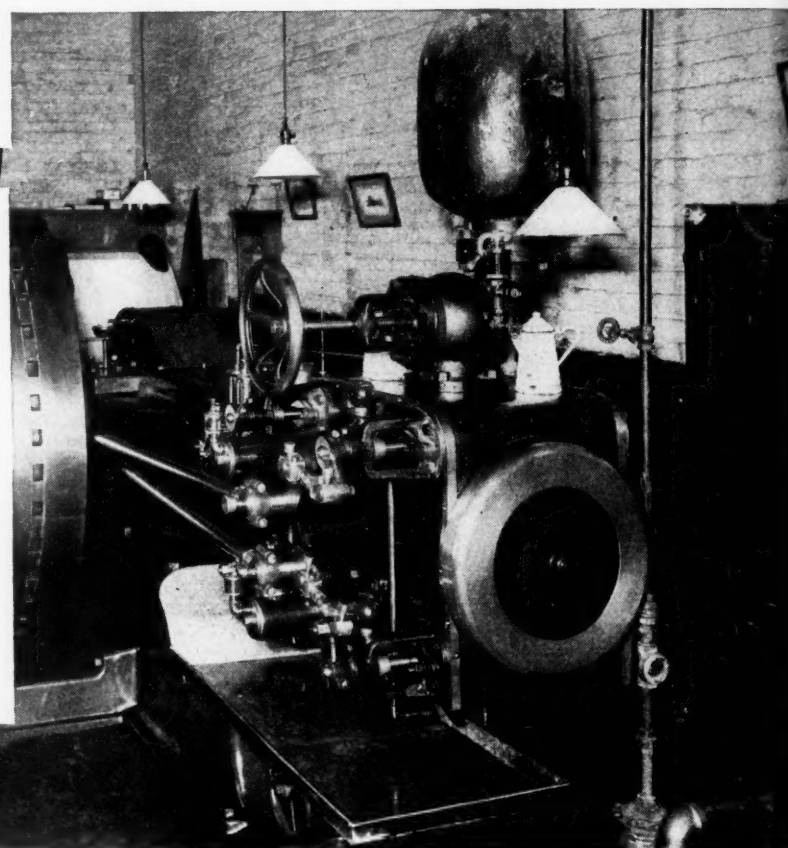
leads to success—*breakdown*, to defeat. To avoid breakdown and delays in STEAM ENGINE operation use . . .



...SINCLAIR STEAM CYLINDER and VALVE OILS.

These oils are suited to all engine designs and operating characteristics, and give *correct* lubrication under any combination of steam conditions, with low oil consumption.

Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.



SINCLAIR INDUSTRIAL OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE NEAREST SINCLAIR OFFICE
SINCLAIR REFINING COMPANY (Inc.)


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FAIR BUILDING
FT. WORTH



JEFFREY 29-U UNIVERSAL COAL CUTTER
- a high tonnage unit, track type or crawler-mounted. Cuts anywhere in the seam. Fast, flexible hydraulic control gains production time... reduces mechanical strains... takes hard labor out of mining.





JEFFREY

EQUIPMENT for

MECHANIZED MINING

DRILLS

LOADERS

CONVEYORS

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 **CUTTERS**

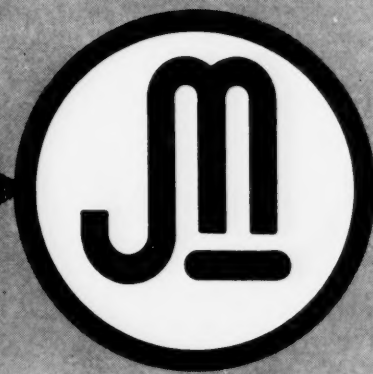
BLOWERS

JIGS

CRUSHERS

SCREENS

RENEWAL PARTS



BELOW AND ABOVE GROUND
FROM FACE TO RAILROAD CAR

Y
for
MINING

MAINTENANCE HINTS FOR CUTTING MACHINES . . .

(HYDRAULICALLY-OPERATED)

To get continuity of service and maximum production from your cutting machines with the least time out for repairs.

1. KEEP THE CUTTING MACHINE CLEAN

Keep accumulation of cuttings removed that may interfere with free operation of adjustments and controls. Once a week use compressed air to blow out dirt and grease accumulation. Look inside motor frames once a week. If accumulation of dirt or grease is found, remove it and remove cause. Keep commutators and brush holders clean—also inside of all electrical enclosures. Cleanliness helps to reveal minor defects—permits correction before they result in breakdowns requiring major repairs.

2. MAKE SCHEDULED INSPECTIONS

See that all control contacts make good contact—replace before too worn to function properly. Check electrical connections—see that they are tight. Look over gearing for any irregular wear or misalignment that might reveal excessively worn or damaged bearings that should be replaced. Generally some unusual noise accompanies this condition. Check cable reel for free operation—proper cable tension. Check all drive chains for adjustment and wear. Keep cutter chain properly adjusted—not too tight. At frequent intervals inspect hydraulic system for leaks. Clean out screens and filters once a week. Keep oil level up in tank. Every 150 operating shifts—drain, flush with clean oil and refill tank. Water as well as dirt must be kept out of hydraulic system.

3. LUBRICATE AT REGULAR INTERVALS

Use proper kind and proper amount of lubricant, as indicated on lubrication chart. Keep pressure fittings in good shape—handle all lubricants and lubricating devices so that they do not become contaminated with foreign matter.

4. OPERATE THE MACHINE PROPERLY

Pause on each point of controller when starting the motor. Running through the points too quickly is detrimental to the motor, particularly the commutator. Do not run on resistance except for such speed control as may be required in tramming. Do not run with dull bits—keep cuttings shovelled away from chain. Dull bits—cuttings carried back in the kerf—cutter chain too tight . . . not only overload the machine but cut down production.

THE JEFFREY MANUFACTURING COMPANY
912-99 North Fourth Street, Columbus, Ohio

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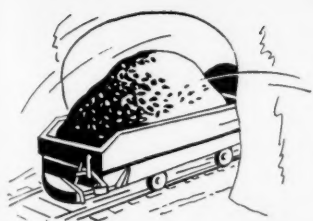
Service Stations:

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Scranton

ROUND
AD CAR



Take It Away. Production isn't production until it reaches the surface. The more highly mechanized the mine becomes, the more critical the work of the haulage units . . . the more important the characteristics of the batteries powering the units. Alkaline batteries are not subject to unexpected failure—therefore hold no threat over the flow of production.

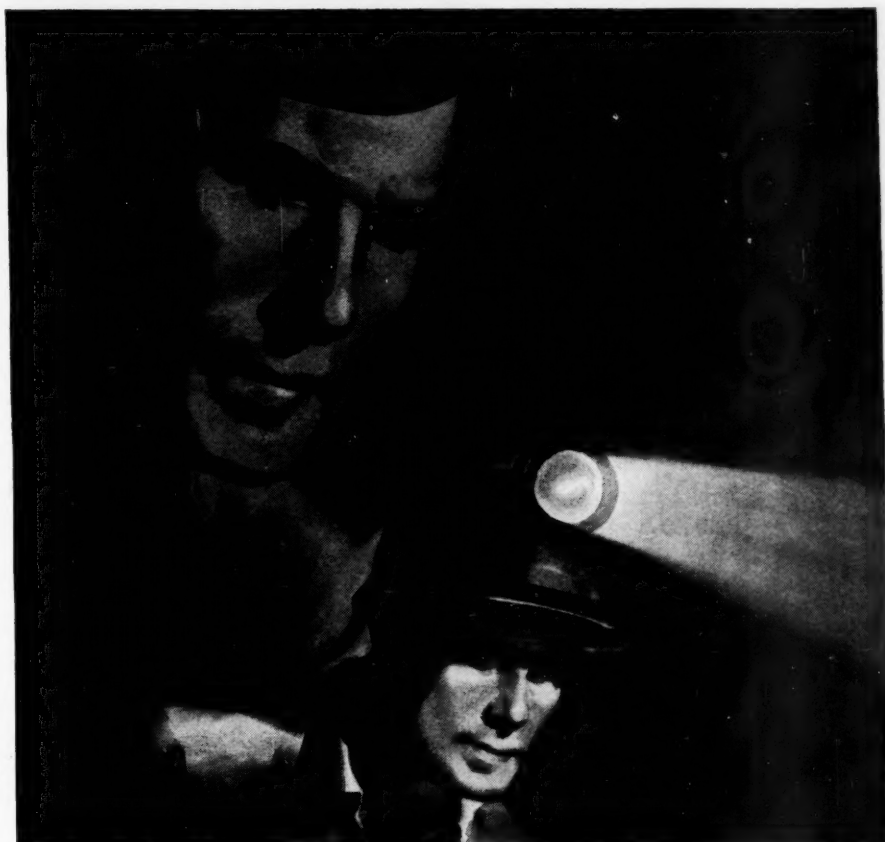


Chance of a Lifetime. It takes the best equipment to get out the highest production—and it's high production Uncle Sam is most interested in today. Actually, it's a great opportunity to equip your haulage units with the most dependable batteries of war or peace—the alkaline type.

Fast Mining. Fast charging of batteries is directly related to fast-flowing production. Alkaline batteries can be fully charged in 6 to 7 hours—which means they are available for work the following shift. And they can be charged direct from d-c lines.

Edison Storage Battery Division
Thomas A. Edison, Inc.
WEST ORANGE, N. J.

POWER for Production



It's the production that comes to the surface that matters! It doesn't matter how much the men at the working places are producing unless the haulage system keeps pace. That's why haulage power units should be as foolproof as possible—why

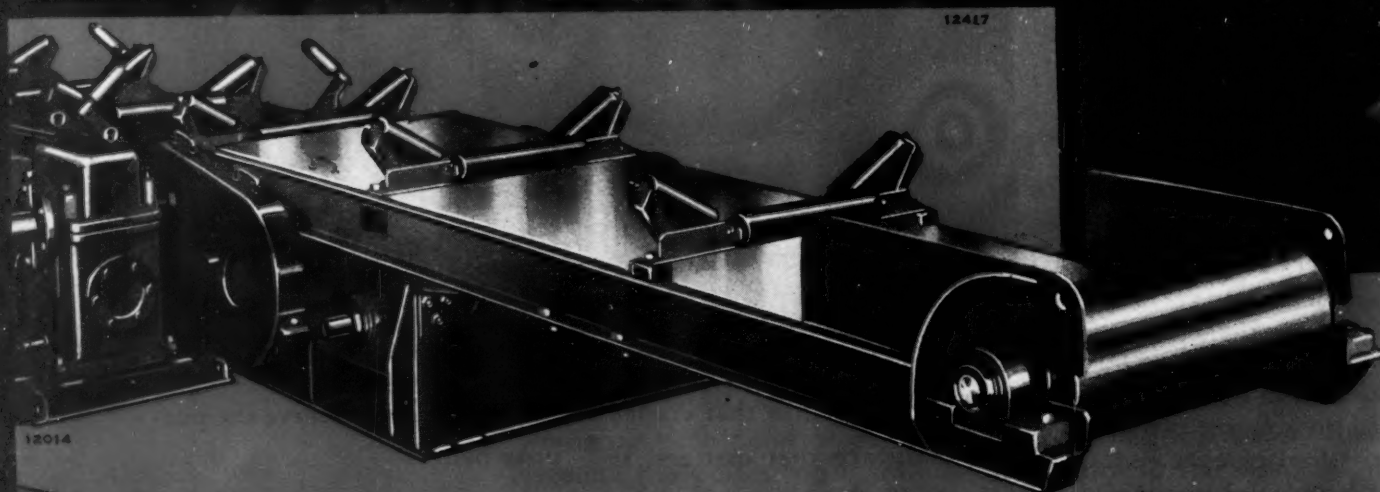
alkaline batteries serve the purpose better.

No more rugged, reliable portable power unit is known to mining than the alkaline battery. It is an Edison invention—mechanically durable and electrically sound.

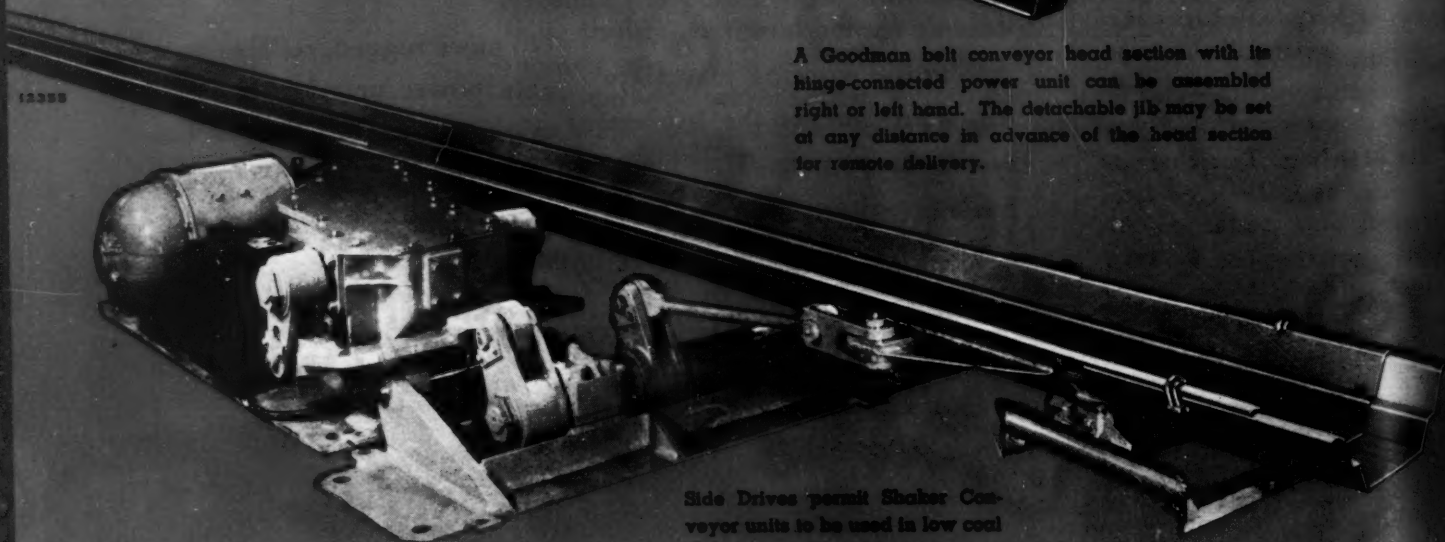
MINING NEEDS THE DEPENDABILITY OF

Edison Alkaline BATTERIES

GOODMAN



A Goodman belt conveyor head section with its hinge-connected power unit can be assembled right or left hand. The detachable jib may be set at any distance in advance of the head section for remote delivery.



Side Drives permit Shaker Conveyor units to be used in low coal without sacrifice of capacity.

GOODMAN MANUFACTURING COMPANY

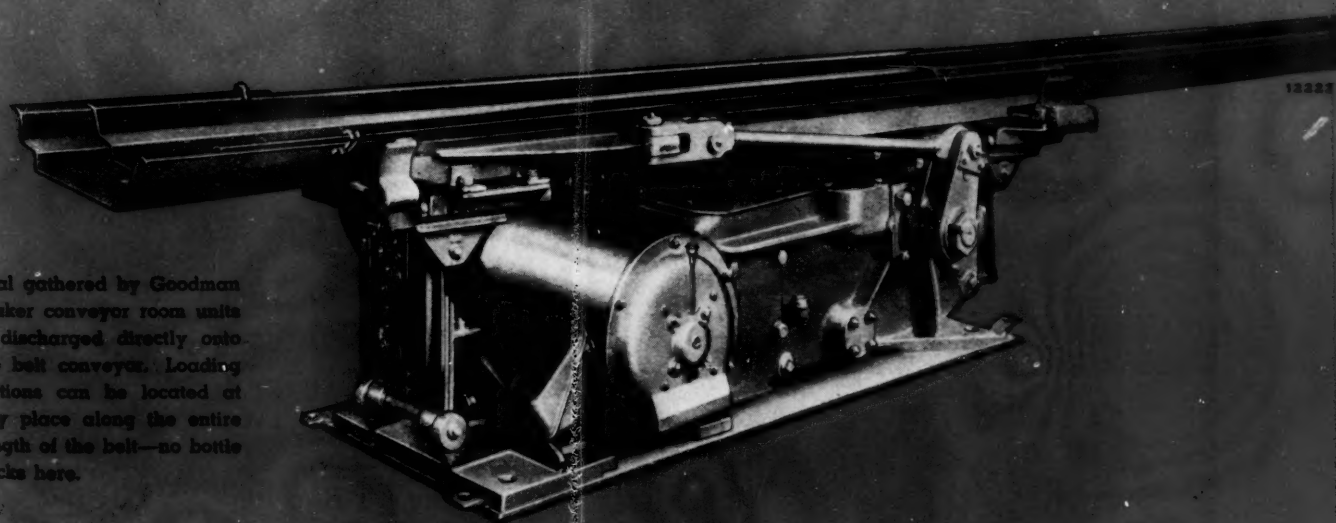
GOODMAN *Conveyor Equipment*

- *For long distance gathering*
- *For room or entry driving*
- *For work at the face*

Goodman Belt and Shaker Conveyors meet every underground condition and capacity requirement. They are quickly and easily installed, extended or relocated, are exceptionally suitable for work under bad top and in close timbering, have low maintenance cost and are ideal for three shift operation.



A feature of all Goodman Belt Conveyors is the self-cleaning tail pulley for keeping the underside of the belt clean.



Coal gathered by Goodman shaker conveyor room units is discharged directly onto the belt conveyor. Loading stations can be located at any place along the entire length of the belt—no bottle necks here.

HALSTED STREET AT 48TH • CHICAGO, ILLINOIS

Keep that Extra Margin of Safety!

The extra margin of safety provided by Atlas Manasite Detonators is an advantage at any time... but never more so than in these months of all-out production essential to the war effort.

By reducing the chance of mishap through inadvertent mishandling, Atlas Manasite Detonators help to avoid accidents... accidents that may cause serious disruptions in man schedules, equipment schedules, and production schedules.

Of course, no detonator is foolproof. But more than 200 million Atlas Manasite Detonators have already been used

—and their extra margin of safety is a big advantage.

Manasite Detonators require no special equipment or change in methods of use. And they cost no more.

Can you afford *not* to use this advance in safer blasting?

MANASITE—Reg. U. S. Pat. Off.

ATLAS MANASITE DETONATORS

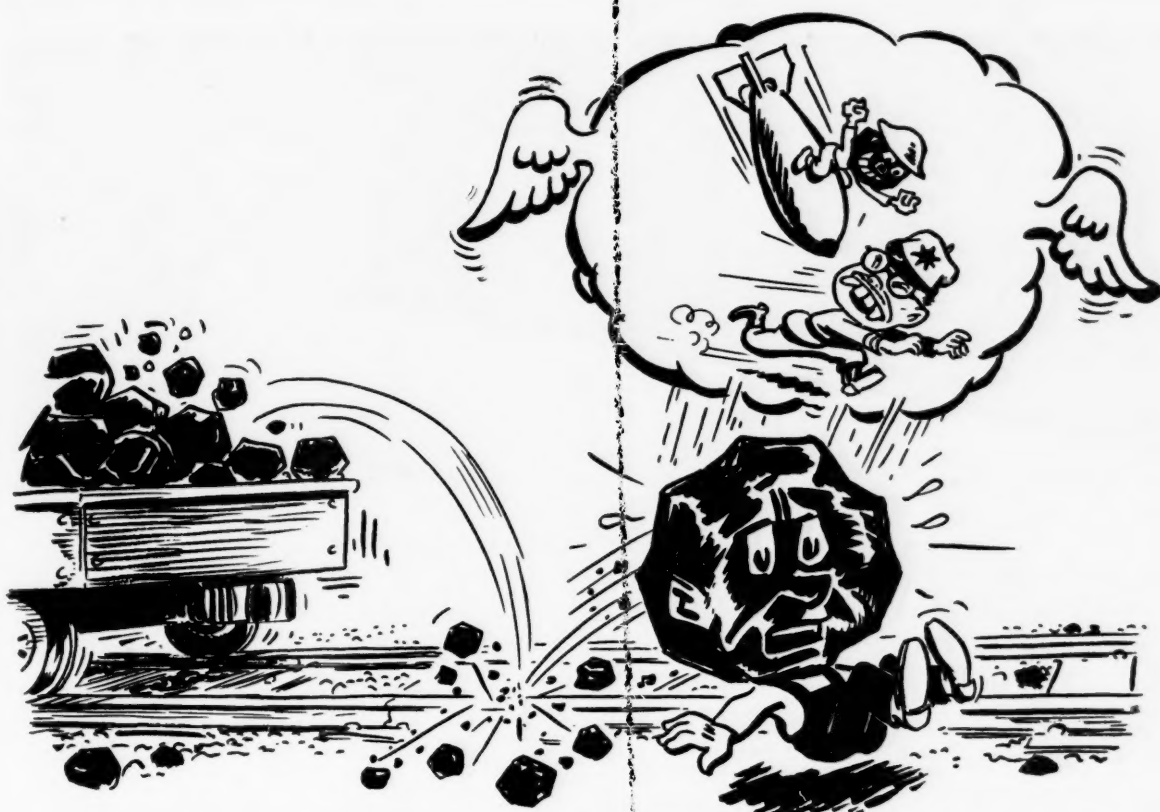
for GREATER
SAFETY

ATLAS EXPLOSIVES

"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington, Del. • Offices in principal cities • Cable Address—Atpowco



He's Lost His Chance to Bag a Jap...

Pity this poor, forlorn lump of coal. Spilled from his berth in a jolting, banging mine car, he never had a chance to go to war; never even had an opportunity to make his boss a profit. But it's not his fault! If his boss had only insisted on O-B Automatic Couplers for those new mine cars, like as not he'd already be a part of a big "block-buster" bomb — maybe winging his way to Tokyo.

Let the O-B Automatic Coupler-equipped car give your coal a "sleeper" ride. Rigid steel-beam connections keep the cars in a

smooth, straight-pulling line, eliminate from 15 to 20 feet of dead slack per trip. Rubber draft gears absorb damaging jolts and strains which often rob your cars of their top layer of coal.

If you are considering the purchase of new mine cars and want to utilize them to their fullest capacity, install O-B Automatic Couplers—the only truly automatic coupler that gives you positive interlock, an unbreakable rubber draft gear and automatic self-centering. Write today for full information.

2369-AM



Ohio Brass
MANSFIELD, OHIO
CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

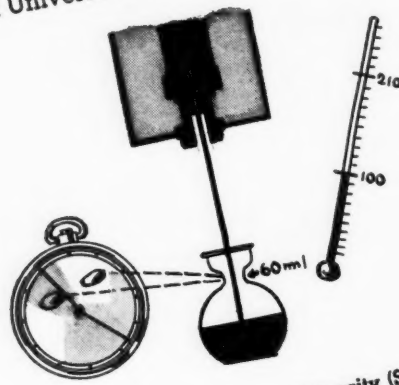
VISCOS

TIDEWATER LUBRICANIA

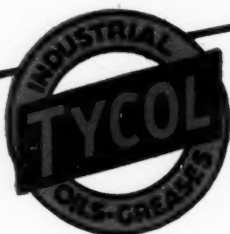
DEFINITION: The resistance to distortion offered by a fluid, because of its cohesion or internal friction, is called Viscosity. A heavy bodied slow pouring liquid is high in viscosity.

TEST: The commercial instrument commonly used in the United States for determining viscosity of mineral lubricating oils is the Saybolt Universal Viscosimeter (S.U.V.). The viscosity, expressed in seconds (Saybolt Universal), is the time required for 60 milliliters of the liquid to flow through the standard aperture of the instrument at a stated temperature.

The Saybolt "Furol" Viscosimeter is often used in connection with very heavy oils. Multiply Furol seconds by 10 to obtain approximate Saybolt Universal seconds.



Examples	Viscosity (Saybolt Universal)	
	at 100°F	at 210°F
Kerosene	32 sec.	40-50 sec.
Light Machine Oils	150-250 sec.	150-250 sec.
Steam Cylinder Oils	2000-6000 sec.	



DRUMS! DRUMS! DRUMS!
War needs make it extremely important that all empty drums be returned immediately.

TYCOL
SCIENTIFICALLY

SITY



*This #1 of a series of informative messages concerning the meaning and significance of commonly used tests and terms employed to describe the characteristics of lubricating oils.



Tycol lubricants are manufactured to definite, predetermined viscosities. Each Tycol lubricant when used for the recommended purpose provides correct viscosity at the operating temperature. This accomplishes

complete separation of the rubbing surfaces by a film of oil for their protection, yet without needless drag from excessive fluid friction. This is but one of many tests that assure unvarying high quality in Tycol lubricants.

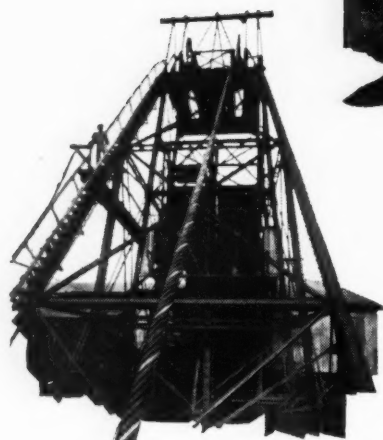
TIDE WATER ASSOCIATED OIL COMPANY

Eastern Division: 17 Battery Place, New York • Principal Branch Offices: Boston, Philadelphia, Pittsburgh, Charlotte, N. C.

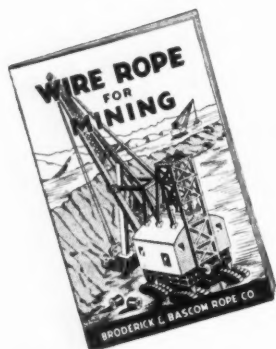
MAKERS OF THE FAMOUS VEEDOL MOTOR OIL

INDUSTRIAL LUBRICANTS

ENGINEERED FOR EVERY INDUSTRIAL USE



Use the wire rope that's cut out for today's jobs



FREE—this 96-page Mining Hand Book of useful wire rope facts and tables. Send for it today.

There's no place for slack in the coal industry's program—or in a vital mining cable. To accelerate production, to strengthen your defense against equipment shutdowns, you need the workability and durability of Preformed Yellow Strand. With this time-tested wire rope handling the load, giant stripping and loading shovels can take the full bite. Main hoists can utilize their high speeds with safety. Above and below ground, cable-using machines can move closer to capacity operations and put off replacements.

These gains result from pointing up Yellow Strand's stout, drawn-to-order steel wires with the limberness of preforming. The rope reeves easily... runs freely around small sheaves... spools evenly despite overloads. Still every length is as tough as ever—highly resistant to shock, abrasion and drum crushing. Today time-and-labor-saving cable counts *double* in production. Install Preformed Yellow Strand and help your men and machines deliver to the limit.

BRODERICK & BASCOM ROPE CO., ST. LOUIS

Branches: New York • Chicago • Houston • Portland • Seattle

Factories: St. Louis • Seattle • Peoria



A MAINSTAY OF NATIONAL DEFENSE



★ ★ ★ ★

HOW TO KEEP PRODUCTION UP...

since so many miners
have exchanged lamp caps
for service caps



McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

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The McNally Pittsburg Mfg. Corp.

307 N. Michigan Ave.

CHICAGO, ILL.



these bulletins explain HOW YOU CAN INCREASE YOUR TONNAGE with fewer men . . .

How to produce 600,000,000 tons of bituminous coal in 1943 with fewer men and a scarcity of vital equipment calls for the greatest ingenuity on the part of coal mine operating officials.

WPB, WMC, the Army, Navy, and Industrial Users of coal know that our War-Winning Machine starts at the mines. Reaching the production goal in 1943 is going to be tough for operators. But we will do all in our power to help you keep the wheels running up to full capacity through efficient servicing of McNally Pittsburg equipment when needed, prompt shipment of repair parts, and by supplying you with new equipment up to the limit of your eligibility for obtaining it.

As an aid toward the selection and use of the most efficient

equipment to maintain production with fewer men, we offer this complete data bulletin service. These bulletins are letterhead size for convenient reference and range all the way from 4 pages to 48 pages. They are profusely illustrated and cram full of technical data.

Dimensional drawings of each unit of equipment make available vital information for your engineering department; phantom illustrations demonstrate working principles for your operating department; illustrations of complete washeries and preparation plants are of very practical value to your architect and construction superintendent.

The bulletins are yours for the asking. Write for them or send the coupon below.

“In many cases the installation of various combinations of McNally Pittsburg equipment, costing not more than \$60,000.00, will release up to 35 men for increasing tonnage in the mines or for other essential industries . . .”

Our engineers will gladly consult with you on your wartime production problems.

M'CNALLY PITTSBURG

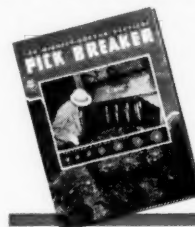
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Mfg. Corp.
307 N. Michigan Ave., Chicago, Ill.

Please send me the following bulletins:

(Indicate on this line bulletins by number)

Your name
Title
Company
Street
City State
CASR



Bulletin No. 241-2
Describes and illustrates vertical pick breakers. A table captioned "Capacities in tons per hour" supplies data to enable you to select proper breaker to produce premium sizes.



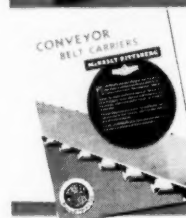
Bulletin No. 440
Installation photographs and scale drawings in this bulletin will prove a great aid to you in the selection of rotary dump equipment. 12 Pages of valuable information.



Bulletin No. 441
Tells "The story behind the McNally-Norton Coal Washer." It illustrates and describes the compound washer, unit washer, and standard 2 to 5 cell washer.



Bulletin No. 442
Seven sizes of Stoker Coal Crushers are described. Phantom view demonstrates operating principle. Two pages devoted to drawings and capacities.



Bulletin No. 339
Data tables and reproductions of blue prints furnish complete information regarding the McNally Pittsburg Belt Conveyor Carriers.



Bulletin No. 342
Twenty-page bulletin devoted to comparative data on the six types of breakers and crushers. Information so complete that you will find it a great aid in ordering.

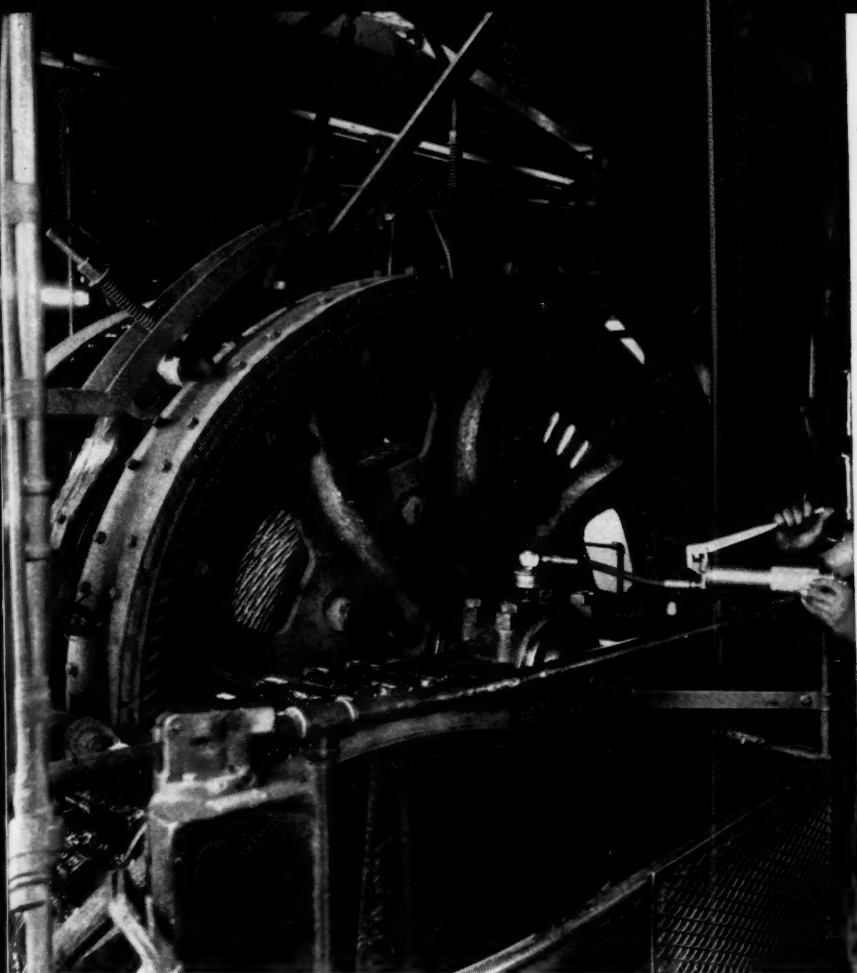


Bulletin No. 242
Explains in detail the advantages and principle of heat and mechanical drying. Phantom illustrations demonstrate the flow of heat and coal.



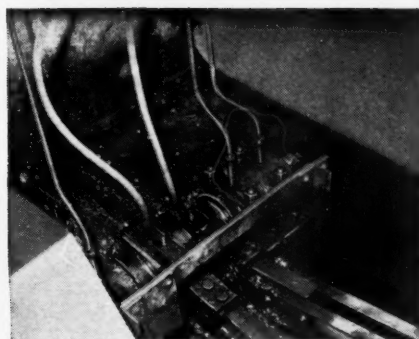
Bulletin No. 142
Illustrates washeries and coal preparation plants, designed, equipped, and erected by our engineering department. Explains how McNally Pittsburg units can be assembled into complete plants.

MAIL REPLY CARD TODAY



Reduces time out for shovel maintenance. Main bearings on a hoist drum in a dragline at an Illinois pit normally ran moderately warm. But when it was necessary to operate for long periods under heavy loads, the bearings became dangerously hot.

A Standard Lubrication Engineer found there was nothing wrong with the bearings, so he recommended a grade of Superla Grease designed for these heavy loads. Now bearing temperatures are normal under all conditions. The operator can get maximum output from the shovel when it's needed.



One-third as much oiler time needed. Screen eccentric bearings "just naturally run hot." At least that is what the Superintendent in an Illinois strip mine had decided. But, when a modern coal washing plant was installed and the new eccentrics also overheated and threw off the grease almost as soon as applied, he began to think it wasn't so natural.

He decided to try the suggestion of a Standard Lubrication Engineer, "Use a good quality of grease and see if it doesn't save enough maintenance, oiler time, and grease to more than pay the difference in price." The Engineer recommended Superla Grease.

The first test was thoroughly convincing. Superla lasted 3 to 5 times longer. The oiler spent less than one-third as much time lubricating the equipment. The saving in maintenance can only be estimated; but now that bearings operate at more normal temperatures, the danger of failures is considerably reduced.



Avoids shutdowns on overworked steam engine. Excessive wear developed in the Corliss engine pictured above in a Wisconsin manufacturing plant. The engine would not pull its normal load. Steam consumption was so high it was necessary to shut down to build up steam pressures.

Indicator cards were taken by the Standard Oil Engineer. Valves were set, new piston rings installed, and the engine started on Stanocyl Steam Cylinder Oil.

The engine now operates satisfactorily on all loads—steam pressure is adequate and no time is lost in shutdowns. This, plus a 30% reduction in lubricating costs!

Prevent time-taking breakdowns

This Way . . .

Day by day Standard Oil Engineers are called on to analyze today's mine equipment lubrication. Some examples are given here of the problems they meet and the worthwhile savings they have made in solving them—adding life to overworked equipment—avoiding shutdowns—saving maintenance time.

By combining his mine experience with his knowledge of lubricants, a

Standard Lubrication Engineer can help you get similar results—can short-cut the testing and experimenting period. That saves both your time and your equipment.

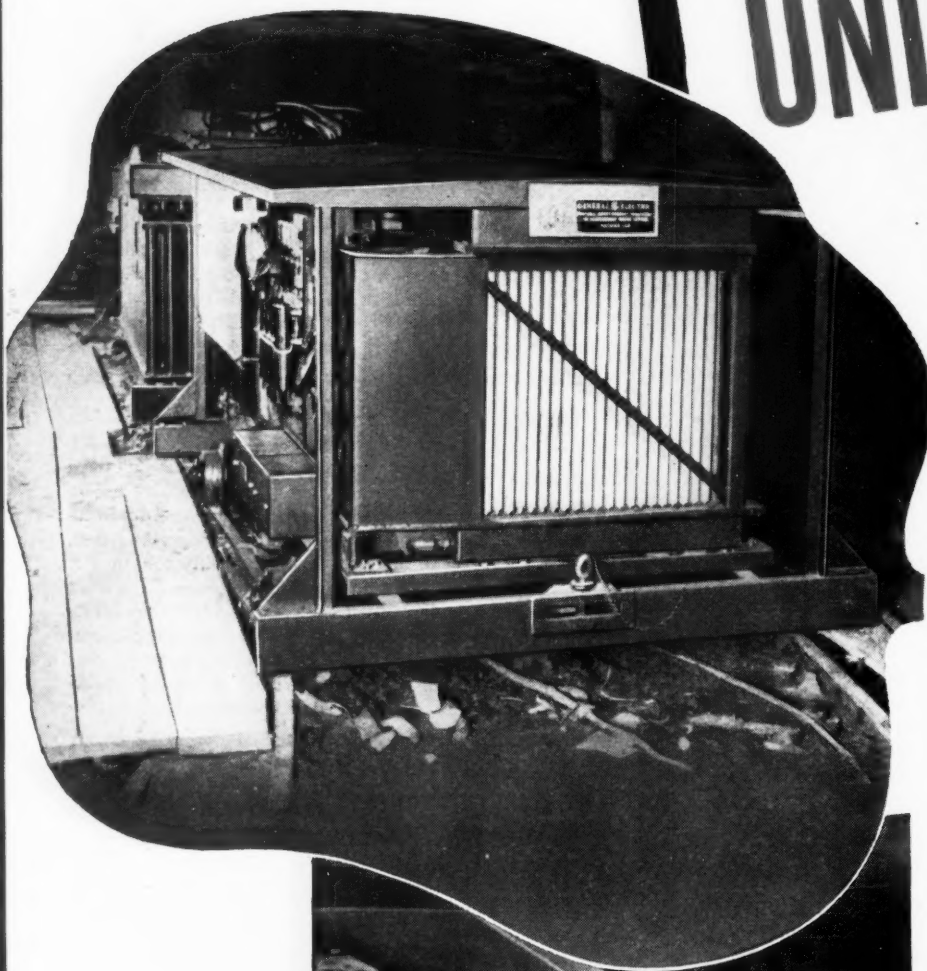
Write Standard Oil Company (Indiana), 910 South Michigan, Chicago, Illinois, for the Engineer nearest you.

OIL IS AMMUNITION . . . USE IT WISELY

LUBRICATION ENGINEERING ★ STANDARD OIL COMPANY (INDIANA)

In the Big Jim Coal Company mine at Blanche, Ky., this 200-kw G-E portable, d-c substation gives full voltage for most efficient operation equipment at the working face. There's no need for long runs of heavy copper.

HERE'S UNDERGROUND POWER



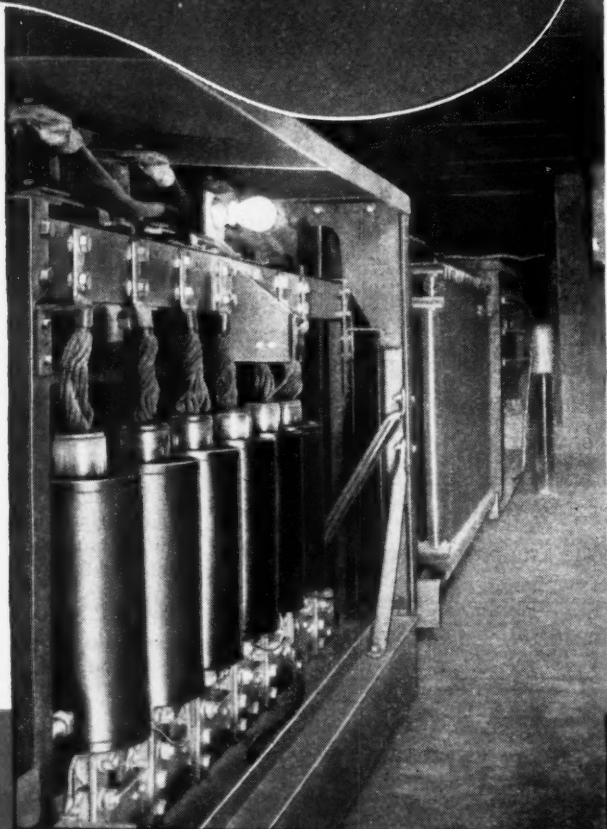
TODAY, your decisions concerning underground power depend on a new set of factors: Will a new d-c substation help bring up enough more coal to balance the critical materials that go into it? Will it save enough manpower to balance the installation work? And how soon can it be obtained?

On each of these new counts—as on the old cost-saving, loss-reducing basis—G-E portable substations with sealed-ignitron rectifiers have the odds on their side. Conversion to d-c closer to the working face saves a large amount of copper, an extremely critical material today. It keeps full voltage at the working face. With full voltage at the face you can get greater output from your mechanized equipment, which means you can bring up more coal.

The sealed-ignitron mercury-arc rectifier does the conversion job with less servicing, thus saving manpower. What maintenance there is, is easy. It's a "natural" for mine conditions, where grit and dirt are such a threat to rotating machines.

These G-E portable substations for underground mine service are supplied in ratings from 150 kw to 500 kw; 275 volts to 600 volts, d-c. At the present time we can deliver them to you in less time than it takes to deliver rotating equipment. For complete details and delivery information, call our local office. *General Electric Company, Schenectady, New York.*

→ A close-up of sealed-ignitron units on the rectifier car of a 300-kw portable substation at Union Collieries, Renton, Pa. As a means of underground conversion these factory-sealed, all-metal units make mercury-arc rectification the most practical and the most economically maintained.



The Army-Navy "E", for Excellence in the manufacture of war equipment, now flies over six G-E plants employing 100,000 men and women.

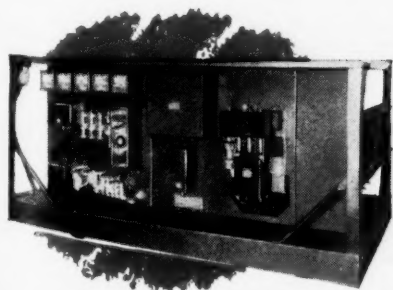
in step with the times!

G-E Portable D-C Substations . . . with Sealed-ignitron Type Rectifiers

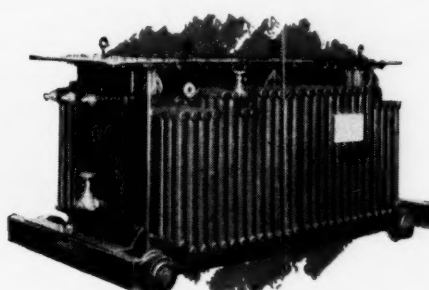
- ★ **FOR GREATER OUTPUT** Complete mobility underground makes it easy to keep full d-c voltage at the face, thus getting the most out of mechanized equipment.
- ★ **FOR SIMPLER MAINTENANCE** No major rotating parts to care for. The sealed-ignitron units (warranted for 3 years' service) require no pumping. No need for specially trained personnel.
- ★ **FOR WARTIME CONSERVATION** Saves copper, lowers energy losses in d-c transmission circuits. Requires less critical material than any other type of conversion equipment.
- ★ **FOR BETTER DELIVERY** At present, delivery schedules on rectifier units are substantially shorter than on rotating equipment. In most cases, over-all costs are lower, too.

JUST "RUN IN" THREE PORTABLE UNITS AND YOUR D-C POWER IS READY

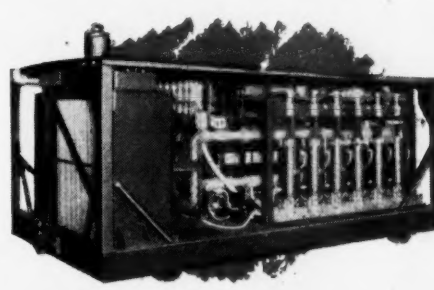
These three integrated "car units" make up a complete substation:



A-c automatic-reclosing switchgear



Pyranol transformer unit



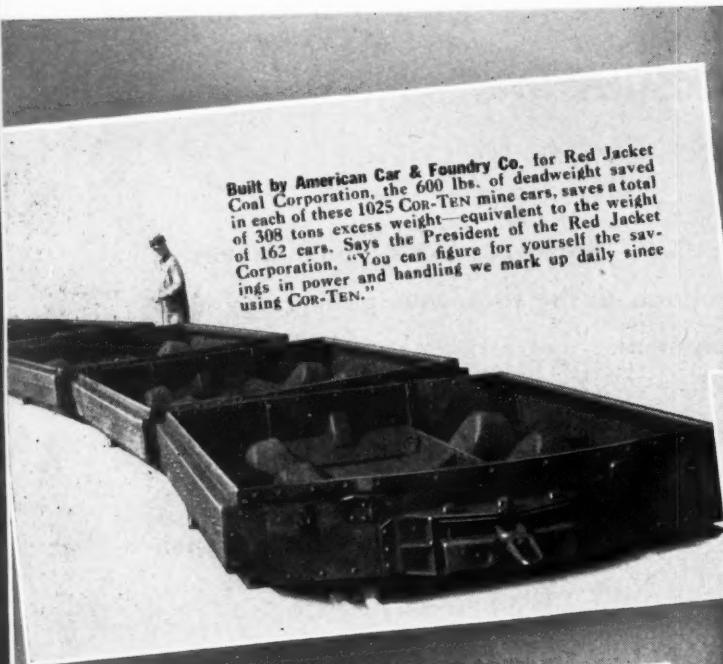
Rectifier car with d-c reclosing switchgear

Builder of ALL TYPES of mine power-conversion units—motor generators, synchronous converters, and rectifiers

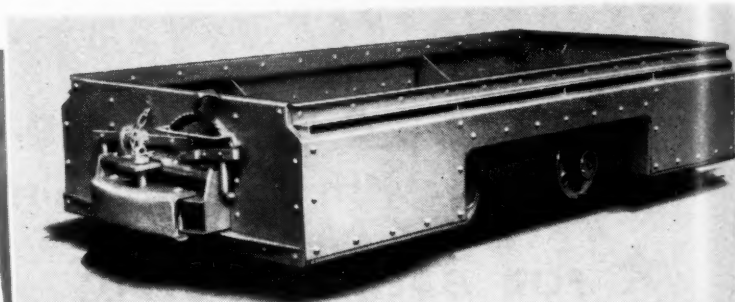
GENERAL ELECTRIC

MAJ. 16-204

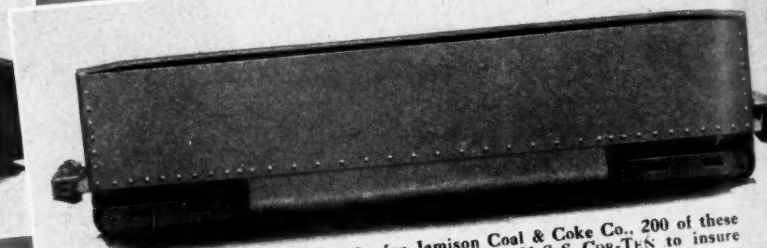
Some mine owners "prepared



Built by American Car & Foundry Co. for Red Jacket Coal Corporation, the 600 lbs. of deadweight saved in each of these 1025 COR-TEN mine cars, saves a total of 308 tons excess weight—equivalent to the weight of 162 cars. Says the President of the Red Jacket Corporation, "You can figure for yourself the savings in power and handling we mark up daily since using COR-TEN."

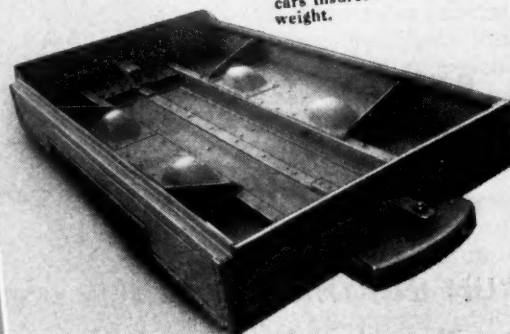
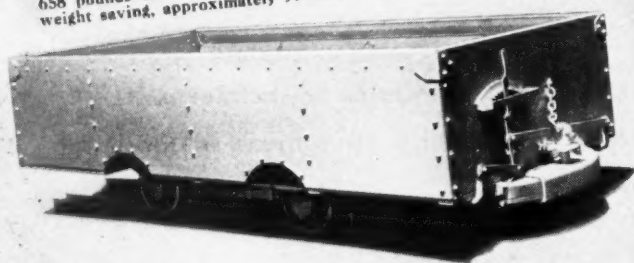


Built by Brown-Fayre Co. for prominent Pennsylvania coal company. By using U-S-S COR-TEN, 420 pounds of deadweight was trimmed off each of these 100 cars at a cost of less than 1 cent per pound saved.



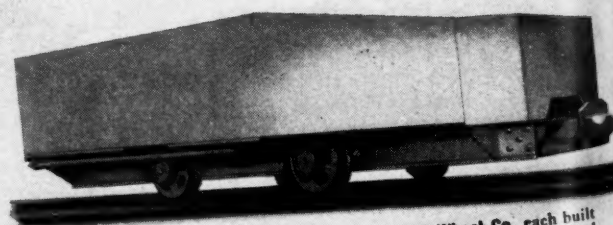
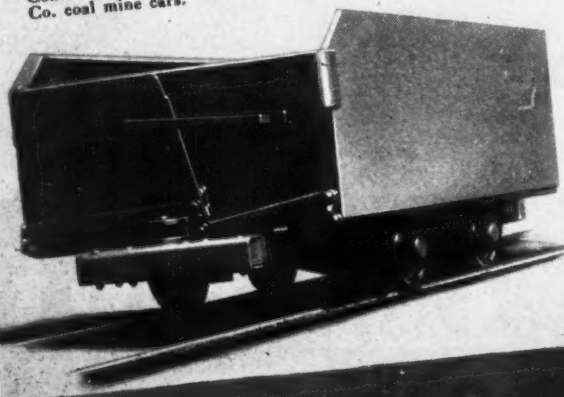
Built by Differential Steel Car Co. for Jamison Coal & Coke Co., 200 of these large capacity "eight wheelers" were built of U-S-S COR-TEN to insure maximum life and strength.

Built by C. S. Card Iron Works Co. for the "largest coal producer in the Rocky Mountain region." COR-TEN construction eliminated 658 pounds of excess weight from each of the 300 cars. Total weight saving, approximately 99 tons.



Built by Enterprise Wheel & Car Corporation for Clover Splint Coal Co., COR-TEN in these 220 cars insures maximum service life with minimum weight.

U-S-S Cor-Ten car built for the H. C. Frick Coke Co., by Carnegie-Illinois Steel Corporation, Lorain Division. U-S-S COR-TEN is the standard specification for H. C. Frick Coke Co. coal mine cars.



Irwin Foundry & Mine Car Co., and Watt Car & Wheel Co. each built half of a 500 COR-TEN car order for the Windsor Power House Coal Co. In these cars, equipped with rubber vibration dampeners, automatic couplers, and roller bearings, COR-TEN was responsible for a weight saving of 733 pounds per car—a total saving of 183 tons deadweight.

UNITED

for War" as early as 1935!

WHEN THEY PUT COR-TEN TO WORK

they gave their mine cars the bigger hauling capacity, the lower operating costs, and the ability to stay on the job so all-important in wartime operation today.

THESE users of COR-TEN construction had in mind no thought of the present conflict when they built their mine cars with COR-TEN. Their prime purpose was to increase load hauling capacity.

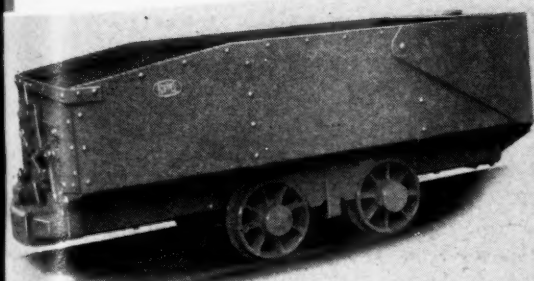
Not only did COR-TEN in mine cars make it possible to haul bigger loads than ever before, but in many cases cars were materially reduced in weight. This in turn reduced the power required to haul them. Less weight on wheels and track systems also meant less maintenance costs.

What is equally important, these cars stayed in service. COR-TEN-built equipment was so strong, tough and rugged that it could be continuously operated at top load with a

minimum of time out for repairs. Taken all together it was just the kind of equipment that would have been built if it had been deliberately planned for wartime service.

There were almost 10,000 COR-TEN coal mine cars in use—and thousands more on order—when the war came along and COR-TEN for mine car construction was out. Today every pound of COR-TEN being produced goes into absolutely essential war equipment.

But COR-TEN will be back. When Victory is won COR-TEN will again be available to increase capacity, save weight, reduce operating cost and prolong the life of your mine haulage equipment. These are facts to remember when you plan for the future.



Built by Pressed Steel Car Co. for Christopher Mining Co., COR-TEN was specified for these 275 cars to give maximum protection against corrosion.

U·S·S High Tensile Steels

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
CARNEGIE-ILLINOIS STEEL CORPORATION
Pittsburgh and Chicago
COLUMBIA STEEL COMPANY, San Francisco
NATIONAL TUBE COMPANY, Pittsburgh

United States Steel Supply Company, Chicago, Warehouse Distributors
United States Steel Export Company, New York



D S T A T E S S T E E L

Haul your Coal as Efficiently as you Strip it!

COAL - STRIPPING operations reach their most productive point when modernized stripping, loading and conveying equipment is linked to the most advanced hauling equipment. In a number of strip coal mines, Walter Tractor Trucks have repeatedly demonstrated their ability to haul up to 55 tons per trip with ease, speed and safety. This super-hauling capacity results from the Walter 4-Point Positive Drive system which provides positive traction at all times, on soft or slippery surfaces and steep grades. This tremendous all-wheel power-plus-traction is

provided by three automatic locking differentials, which proportion the power to each wheel according to its traction at any instant. Less unsprung weight, higher ground clearance and increased gear capacity are some of the advantages of another exclusive Walter feature—Suspended Double Reduction Drive. Single lever control, enormous braking capacity and short turning radius add exceptional safety and maneuverability. Write for full details on Walter Tractor Trucks.

WALTER MOTOR TRUCK CO.
1001-19 Irving Ave., Ridgewood, Queens, L. I., N. Y.

Walter Tractor Trucks





NATIONAL *has developed*

NEW

PERMISSIBLE POWDERS

Not one of the ten National Permissible Powders are more than six years old. Most of them are less than four years old. These Permissibles have been formulated for the purpose of shooting any coal measure occurring east of the Mississippi River. Whether you require slack, or lump, or run o'mine, one of these powders will do your work better, with less degradation and cheaper. These are truly new and revolutionary powders.

TABLE BELOW INDICATES THE WIDE RANGE IN STRENGTHS AND SPEEDS AVAILABLE IN NATIONAL PERMISSIBLE POWDERS

Following tables as of United States Bureau of Mines approved list:

PERMISSIBLES		
BRAND	VELOCITY	CARTRIDGES PER 50 LB. CASE
HIGH SPEED		
National "A"	9800 ft./sec.	1 1/4 x 8 — 142
National "B"	12100 "	" " 160
National "C"	10200 "	" " 225
MEDIUM SPEED		
National "D"	7900 ft./sec.	1 1/4 x 8 — 140
National "E"	9130 "	" " 160
LOW SPEED		
National "F"	6600 ft./sec.	1 1/4 x 8 — 230
National "F"-I	5700 "	" " 250
National "G"	5600 "	" " 200
National "H"	5100 "	" " 180
PERMISSIBLE GELATIN		
NapcoGel No. 1	15000 ft./sec.	1 1/4 x 8 — 103

These Powders are for Anthracite and Bituminous Mines

See our catalog data in coal mining catalogs

NATIONAL POWDER COMPANY
ELDRED (McKean County) PENNA.

MANUFACTURERS OF HIGH EXPLOSIVES FOR ALL INDUSTRIAL PURPOSES

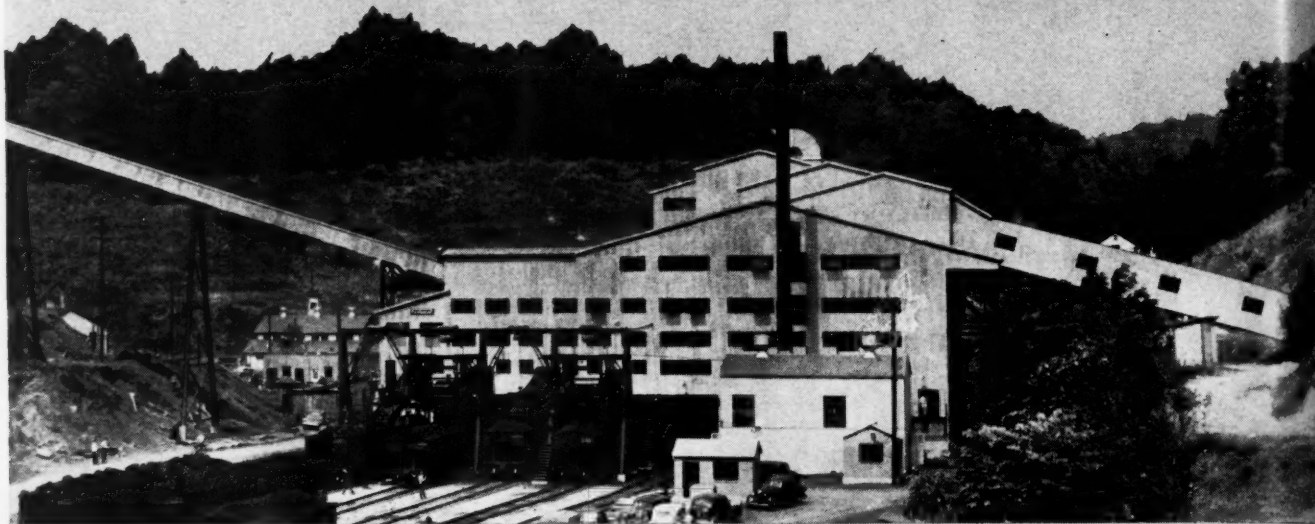
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 Jas. W. Crumback, 1809 Seaborn Ave., Danversville, O. Tel. 2215-W
 A. W. Gillespie, 506 E. 1th St., Shamokin, Pa. Tel. 641
 A. F. X. D'Iorio, New-rose Bldg., Pittston, Pa. Tel. 2870
 A. J. Goodwin, 15 3rd Ave., Kingston, Pa. Tel. Wilkes-Barre 7-5491
 Edward H. Luce, Memphis, Tenn., Tel. 6-1932
 Ernest Mathias, Pinleyville, Pa. Tel. 59
 C. W. Burleson Co., Plumtree, N. C. Tel. 3
 Morganton Hardware Co., Morganton, N. C. Tel. 41
 Supreme Supply Co., 25 N. George St., York, Pa. Tel. 4-6106
 Wald Explosives Sales Co., Worcester, N. Y. Tel. 4721
 P. T. Rogers, 730 Weldon St., Latrobe, Pa. Tel. 636
 Torre Haute, Ind. Tel. Crawford 3875

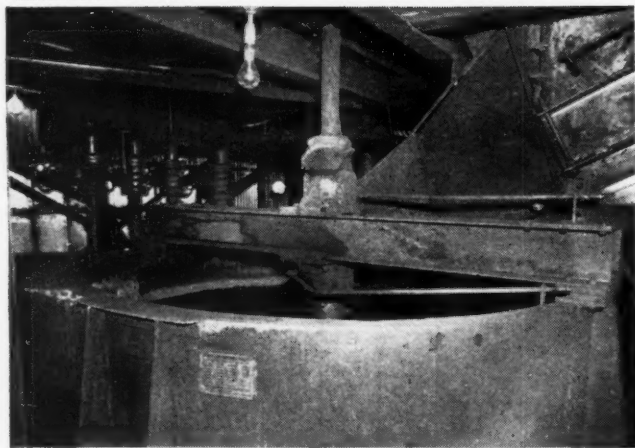
POWDER
NATIONAL
COMPANY

Not living on our reputation but building it.

CONTINUED MAINTENANCE IS THE ANSWER
TO "ALL OUT" **COAL** PRODUCTION...



FAIRMONT SUGGESTS THAT PROPER
CARE OF YOUR PRESENT EQUIPMENT WILL
GIVE YOU MORE AND BETTER COAL



Installation view—Chance Sand Flotation System.

• To adequately meet the various coal needs of a Nation at War it is essential that all equipment from face through the tipple be carefully maintained.

Many producers now equipped with the chance system are finding that this wet process of cleaning is standing up exceptionally well under the stress of greatly increased production—requires very little maintenance—continues to turn out high grade coal.

Others using the American Pneumatic Separator for dry processing coal are having equally successful results with this modern—easily maintained—economical unit.

Regardless of the method you are using (wet or dry) Fairmont Engineers are available to help you get greater efficiency from your present equipment and to assist you in maintaining top production of high quality coal.

TRADE MARK REGISTERED
FAIRMONT

MACHINERY COMPANY
FAIRMONT, W. VA.

The Bonds We Didn't Buy

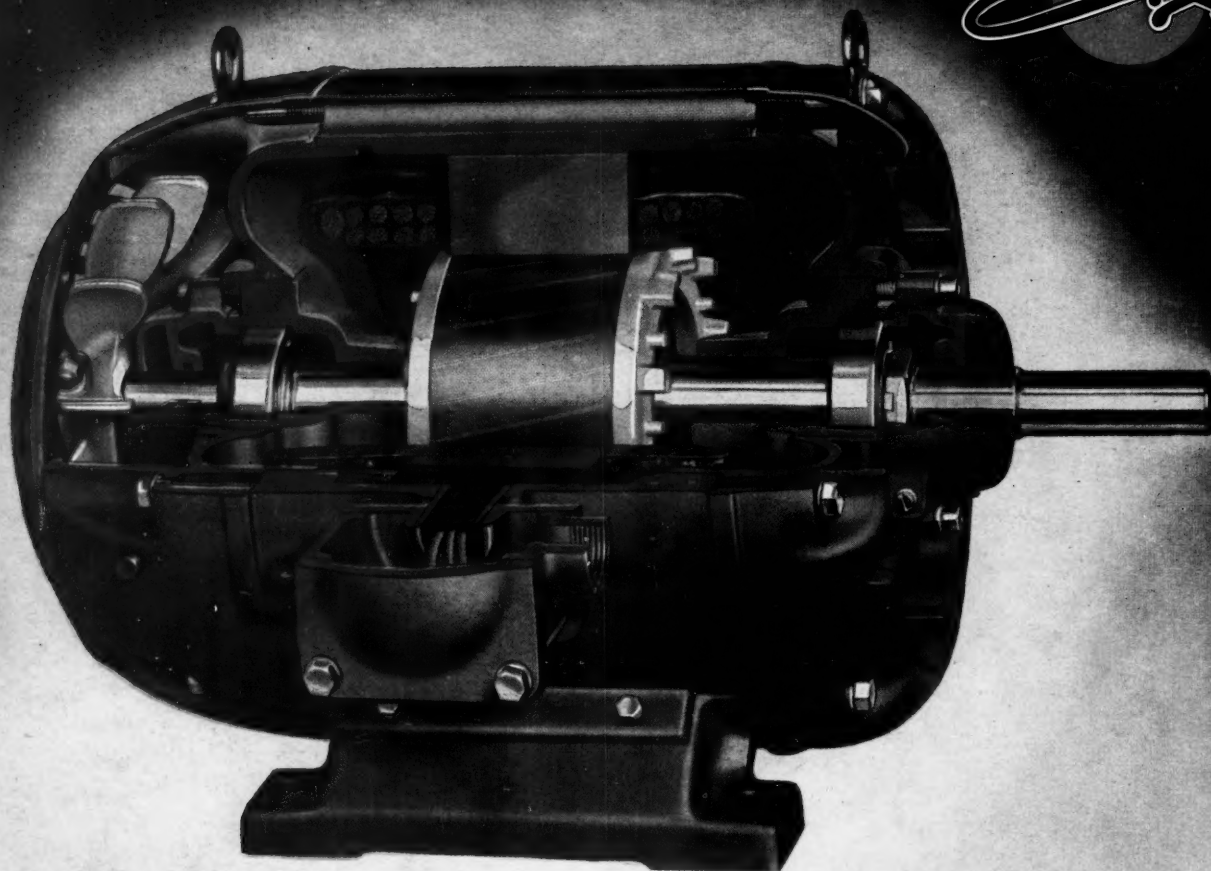
FOR **VICTORY**



**BUY
UNITED
STATES
WAR
BONDS
AND STAMPS**

*For your son and my son!
we **MUST** win this war!*

LOUIS ALLIS



Look Inside!

The Louis Allis **EXPLOSION-PROOF** motor is built to withstand the force of the greatest explosion possible within its heavy iron walls—with a safety factor of five!

With a safety factor of FIVE—the Louis Allis Explosion-Proof has twenty carefully designed specific features—features that make available a new high in electric motor efficiency, dependability, convenience and—SAFETY!

We have prepared a sixteen page booklet which completely illustrates

and describes all of these important features—write for your copy—ask for Bulletin No. 508-E.

LOOK INSIDE—compare Louis Allis Explosion-Proof motor point by point with any others on the market—and we are sure you will agree that—here is the finest explosion-proof motor ever built—bar none!

Specify your next explosion-proof motor by name—**LOUIS ALLIS**—you will be assured of the most complete protection and dependable performance available.

THE LOUIS ALLIS CO., MILWAUKEE, WIS.



Here's MAN POWER with EXPERIENCE

★ These men know what it takes to build a modern mechanical loader for coal, for some of them have been at it from almost the birth of loading machines when, in 1908, we installed the first commercially successful loader in a mine at Wind Rock, Tennessee.

For over 35 years, we've devoted our efforts exclusively to mechanical loading problems in mining. Today, you'll find the "Automat" doing a job not to be equalled by any other machine. You'll find a machine that can take the punching, and stay with it, under triple shift production demands. You'll find a machine that, in some mines, is working two shifts on coal and a third shift on rock and slate cleanup. The "Automat"

is recognized as the only machine that will stand up equally as well under the strain of rock work as it does in loading coal. Yet, its power requirement is supplied by only one 25 H.P. motor.

You can depend upon the "Automat" for top production, continuous, uninterrupted performance, low maintenance and power costs. And remember, it's the safest machine ever built.

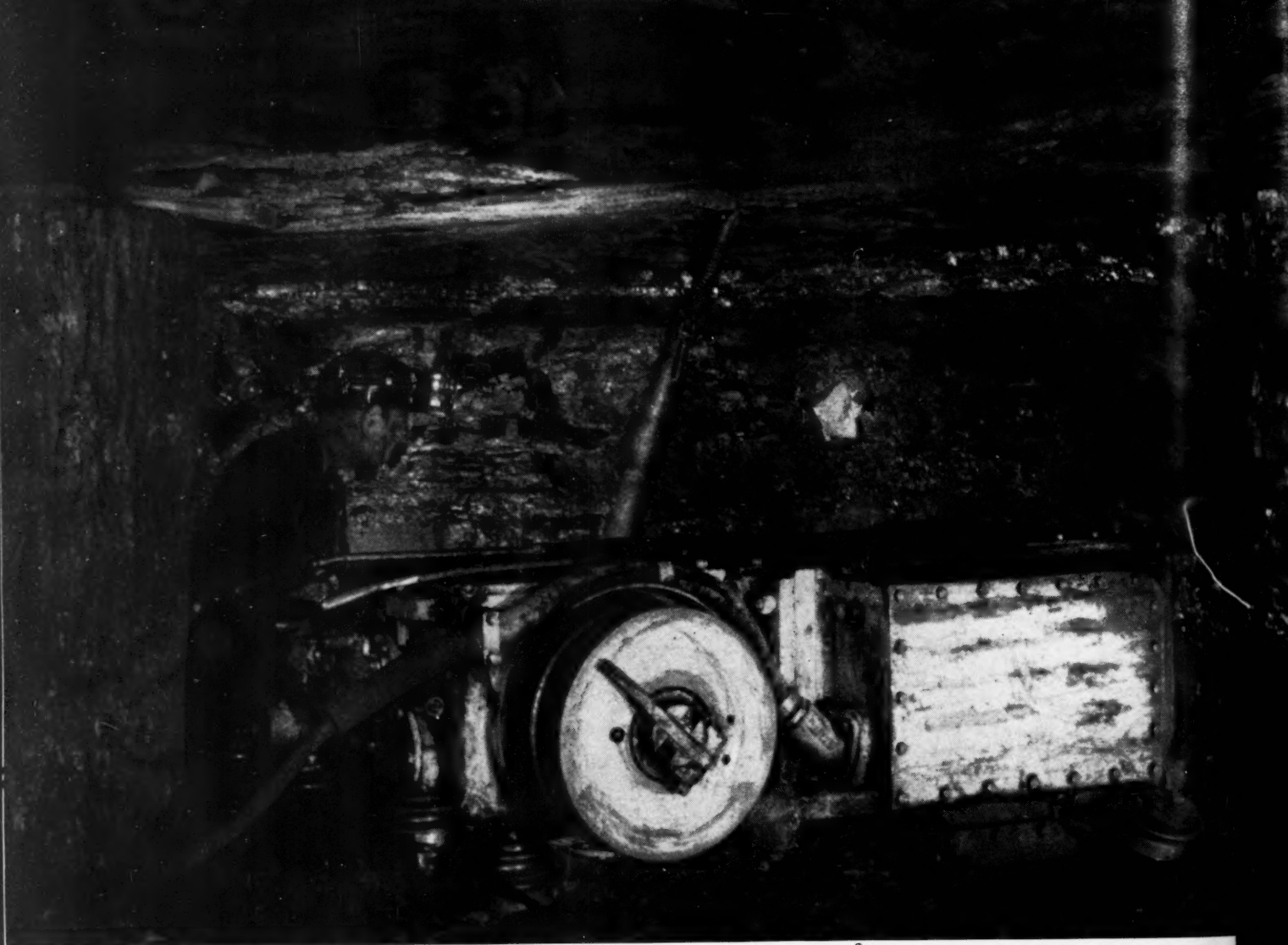
For further information, write Myers-Whaley Company, 123 Proctor Addn., Knoxville, Tennessee.



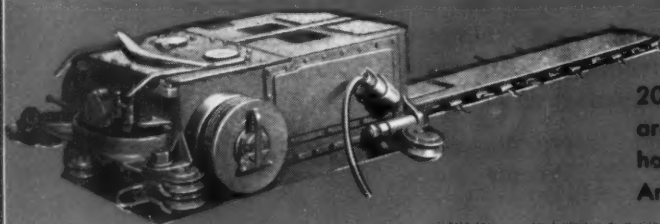
MYERS-WHALEY

*"Mechanical Loaders Exclusively
For Over 35 Years"*

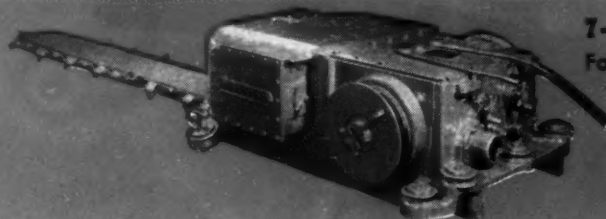
JUST ONE JOB



SPEEDY SULLIVAN COAL CUTTERS FOR EVERY MINING METHOD



11-B Conveyor Type Shortwall Cutter—Only 21 inches high cutting a six-inch kerf yet it delivers cuttings to the rear. 58 inches long. 20, 35, or 50 h.p. A tough little cutter that's speedy in operation, easy to move around and position. Fool proof and convenient operation. Simple controls handled from rear or side. Rugged, accessible construction. Splash lubrication. Anti-friction bearings, alloy steel gears and pinions. Big-load-starting motor.



7-B Shortwall Cutter—A fast cutter that stays well ahead of the loader. For modern mechanized mining. Handles up to a 9-foot bar. Two-direction operation. Variable feed control for hard cutting or worn bits. Easy to handle. Durable—has splash lubrication, alloy steel gears and pinions. 50 h.p. slow speed motor. Superior, through and through construction makes 7-B stay underground longer. All parts easily accessible.



7-AU Universal Track Cutter—Has a 50% longer reach yet it is the fastest and most flexible track cutter. The Sullivan 7-AU will cut in top, center or bottom, make center shears, angle shears, rib shears or slab cuts and in addition has bar tilt and roll. If mining conditions permit, will cut wider rooms for greater tonnage per cut. May be completely controlled from either side of machine.

Sullivan 7-AU is licensed under patents to E. C. Morgan, patents numbers 170691—170692—1707132—1933323—1933324

FOR THE OPERATOR TODAY!

COAL IS BASIC TO VICTORY. Coal is electric power, steel, ships, tanks, airplanes. Any operator who knows *that* knows he has just one job now . . . to produce *more coal faster than ever before*. But coal can't be mined faster than it can be cut. Install Sullivan Coal Cutters and even if you have to use bigger drilling, loading and haulage crews to keep up with them, production will increase and costs will shrink. Cold-blooded cost and production analysis in every coal-producing region shows Sullivan Cutters are the fastest, the most economical, the simplest to operate, the easiest to "keep underground," and *they stay there the longest*. Let a Sullivan representative prove it. **SULLIVAN MACHINERY COMPANY,** Executive Offices: Michigan City, Ind. In Canada: Canadian Sullivan Machinery Co., Ltd., Dundas, Ont.

SULLIVAN

**Coal Mining Machines • Scraper Haulers • Rock Loaders • Hoists
Car Pullers • Air Compressors • Coal Drills • Rock Drills • Cutter Bit
Sharpeners and Heaters • Core Drills and Core Drill Contracting**

★
*Mining
Machines
for Every
Mining
Method*
★

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Chicago, Ill.
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ALLIS-CHALMERS DIESEL TRACTORS IMPORTANT FACTOR IN HELPING MINERS MEET INCREASED DEMANDS OF WAR The sights are set even higher for 1943! More ore than ever is needed! Your thinking will be kept at a higher pitch figuring out ways and means of increasing production.

A salvation for many miners today is the worry-eliminating performance of their Allis-Chalmers 2-cycle Diesel tractors. They can depend on them. Depend on 'em to work thousands of tough hours without overhaul or major repairs. Depend on 'em to purr around the clock, day after day if necessary, without constant nursing and attention. They will handle bulldozing and scraper work easier — strip at a faster clip . . . haul supplies in a hurry . . . build and maintain roads quicker . . . keep trucks rolling smoothly with minimum breakdowns . . . enable more material to flow to the aid of our armed forces! They will help meet the new challenge to your industry!

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE • U. S. A.

2-Cycle DIESEL
THE MODERN POWER

Powerful, fast-working 2-cycle Diesel tractors speed up stripping and road-building — there's more zip, less gear-shifting, load-lugging power! Operate on ordinary Diesel fuels.



CARE IS PROTECTION

Inspect and overhaul your tractors at frequent intervals. Keep tracks at proper tension, make wear take-up adjustments as necessary, replace worn parts before they can damage the surrounding mechanism, lubricate according to instructions. Call in the skilled help of your Allis-Chalmers dealer for inspections, overhauls, rebuilds, repairs. Proper care means longer life.

CARDOX

"THE NON-EXPLOSIVE MINING METHOD"

Conserves

Time

Labor

Equipment

Improves

Safety

Preparation



Write or wire today for practical proof of the wartime advantages of CARDOX. A test demonstration involves no expense or obligation on your part.

CARDOX CORPORATION

BELL BUILDING CHICAGO

A THIRD OF A CENTURY *of* INTERCHANGEABILITY



DURING all the years since NORMA-HOFFMANN Ball Bearings were introduced, PRECISION has been their distinguishing feature.

"But"—we are often asked—"has this PRECISION been unvarying, over all these years?"

An actual test of the INTERCHANGEABILITY maintained in day-after-day, year-after-year NORMA-HOFFMANN production would (we believed) give a convincing answer to the question—since, in the bearing world, INTERCHANGEABILITY of parts cannot be realized unless PRECISION is maintained.

So we secured a number of stock NORMA-HOFFMANN Open Type Ball Bearings—some made 30-odd years ago, others at intervals since. These we dis-assembled and "mixed up"—interchanged inner rings, cages with balls, and outer rings—and reassembled them into complete bearings which were then subjected to our rigid PRECISION tests.

In every case, we found the reassembled unit to be a true NORMA-HOFFMANN PRECISION Ball Bearing, with internal accuracy unchanged and in every respect conforming to our exacting standards.

This is NORMA-HOFFMANN PRECISION—not new or variable or "special"—but a time-tested, inflexible standard of quality. This PRECISION is YOUR assurance of bearing speed-ability and service-ability—YOUR safeguard against bearing troubles.

•
WRITE FOR THE CATALOG
LET OUR ENGINEERS
WORK WITH YOU
•

**NORMA-HOFFMANN
PRECISION BEARINGS**

• • • • •
BALL • • ROLLER • • THRUST
for
EVERY LOAD, SPEED AND DUTY

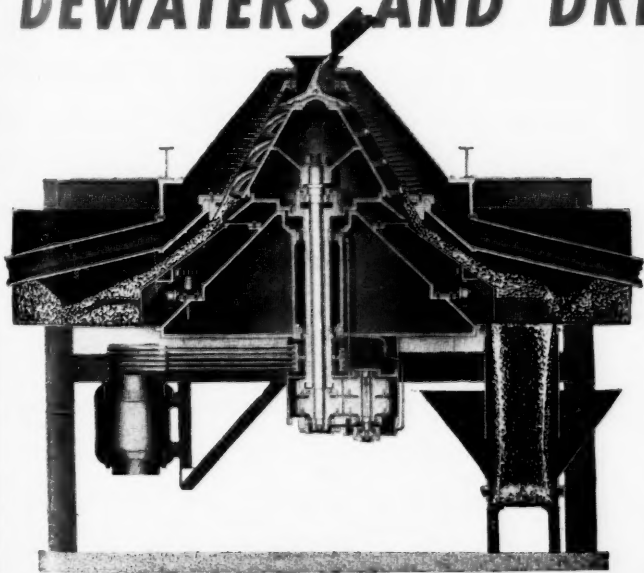
NORMA-HOFFMANN BEARINGS CORP'N., STAMFORD, CONN. . . . FOUNDED 1911

Eliminate

"C-M-I"
Continuous Centrifugal
DRYER

**FREEZING
OF COAL IN
TRANSIT OR
IN STORAGE
and
CLOGGING OF
BINS, SPOUTS
and
CARS**

DEWATERS AND DRIES WITH SPEED . . .



Save time (SO IMPORTANT TODAY) in putting clean dry coal in your customers' bins or stock piles. Save space in installing a "C-M-I" Continuous Centrifugal Dryer. Save power in using it. Save on first cost and on operating cost.

Sludge and slurry coals are easily reclaimed and used for special purposes or mixed with larger sizes when you use the "C-M-I" Continuous Centrifugal Dryer.

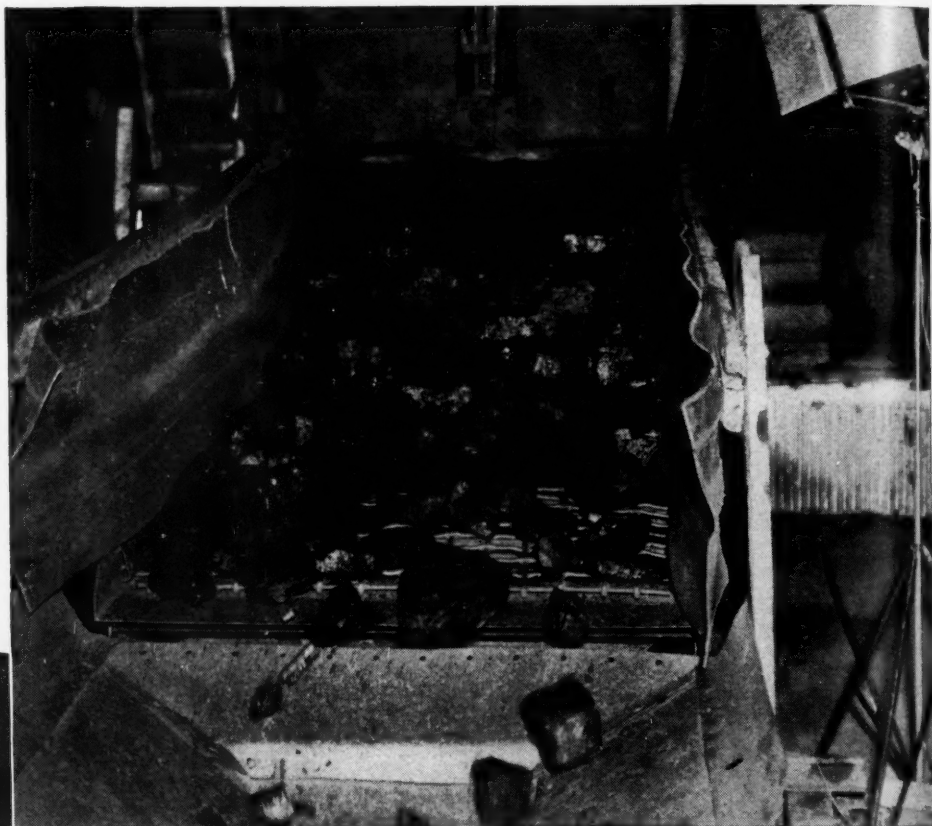
CENTRIFUGAL AND MECHANICAL INDUSTRIES, INC.

SECOND AND PRESIDENT STREETS

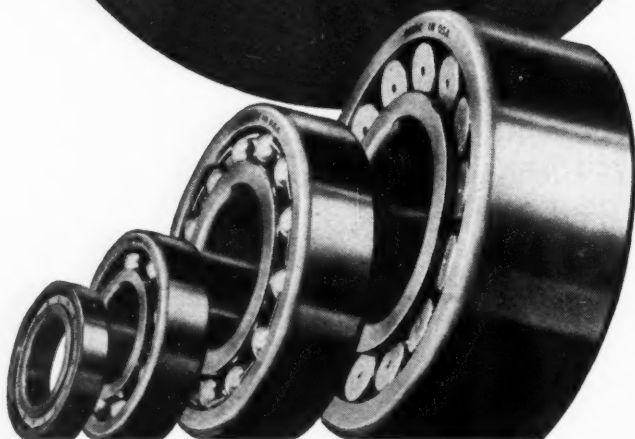
ST. LOUIS, MO.

Screening 1800 LBS. COAL IN 60 SEC. WITH **SKF** BEARINGS

● Built by
SIMPLICITY ENG'G CO.



SKF
Ball and Roller
BEARINGS



The War has brought many tough jobs to SKF-equipped machines. One of them is screening in less than 60 seconds 1800 lbs. of run-of-mine coal, dumped from the car in the tippie onto this 4' x 8' Model "B" Single Deck Screen. But it's another tough job made easy by the ability of rugged SKF's to withstand heavy dynamic and static loads and to compensate for shaft deflections, distortions or weave. When bearings stay on the job, so do the machines of which they are a part.

5213

SKF INDUSTRIES, INC., PHILA., PA.



The Koehler Flame Safety Lamp has two outstanding features that insure protection in the mine.

FIRST — Better Ventilation.

SECOND — Greater GAUZE AREA, for increased sensitivity.

1. For greater safety the Wheat Electric Safety Cap Lamp has an exclusive feature — two bulbs — the second a "Standby" bulb. It is designed and located so that in emergencies, or, should the main bulb burn out, or become broken, the "standby" bulb can be put into use by just "flipping" a switch. Miners wearing Wheat Cap Lamps are never in the dark.

Every part of the Wheat Cap Lamp has been carefully engineered to meet all the requirements of mine lamp use.

For "better light and better sight" use Wheat Engineered Cap Lamps.

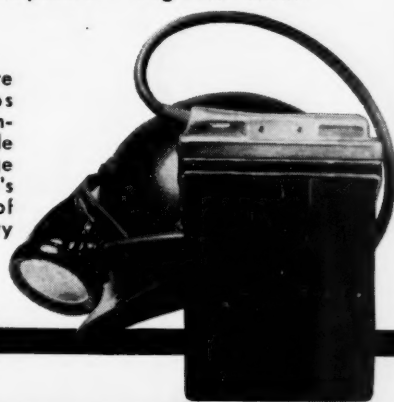
WHEAT

The Engineered Cap Lamp

Here are the features . . . judge for yourself!

- 1** Two bulbs (one for emergencies) — miner is never in the dark.
- 2** Center mounted, Krypton-filled bulb, gives 20% more light — no dark "shadow spot" in beam.
- 3** Choice of 3 reflectors gives narrow concentrated beam, a medium beam, or a widespread beam of light — suits all working conditions.
- 4** Headpiece weighs less than 6 ounces, Lamp Cord 6 ounces, Battery 62 ounces — Total weight of Lamp complete 74 ounces.
- 5** Headpiece molded of strong bakelite; sealed, moisture-proof and dust-proof.
- 6** Rubber battery case — non-conductor of electricity — a valuable safety feature.
- 7** Battery solution (free) limited to one ounce total both cells.
- 8** Lead-acid type battery maintains high voltage throughout shift (80+% efficiency) — year after year.
- 9** Battery charged through headpiece and cord of cap lamp — a daily test of all connections.
- 10** Designed for self-service charging system for lowest lamp-house operating cost.
- 11** To charge, headpiece is simply slipped on to key in charging rack, and turned to make contact. Nothing to take apart — unit-sealed construction.
- 12** A payment plan (purchase or rental) to meet the requirements of companies — large and small.

"Wheat Mine Lamps are the only Mine Lamps 'powered' by Exide Iron-clad Battery Plates made by The Electric Storage Battery Co., The World's Largest Manufacturers of Storage Batteries for every purpose."



Write today —
WHEAT LAMP SALES, INC.
 1501 Kanawha Valley Bldg., Charleston, W. Va.

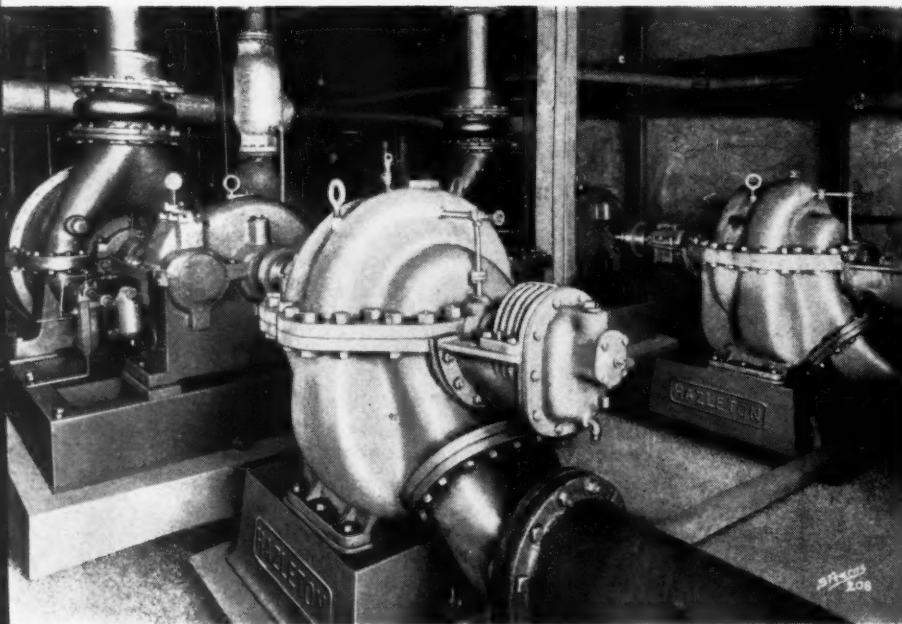
**SPECIALISTS IN MINE
 LIGHTING FOR 25 YEARS**
KOEHLER MFG. CO.
 Marlboro . . . Mass.



The Most Modern PUMPS a

★ For Underground and Recirculating

ALL PUMPS IN THE NEW BREAKER OF THE LEHIGH VALLEY COAL CO. AT HAZLETON SHAFT COLLIERY, ARE HAZLETON PUMPS. SATISFACTORY PERFORMANCE OF OVER 150 HAZLETON PUMPS ON LEHIGH VALLEY COAL CO. PROPERTIES ACCOUNTS FOR THE SELECTION IN THIS MODERN BREAKER.



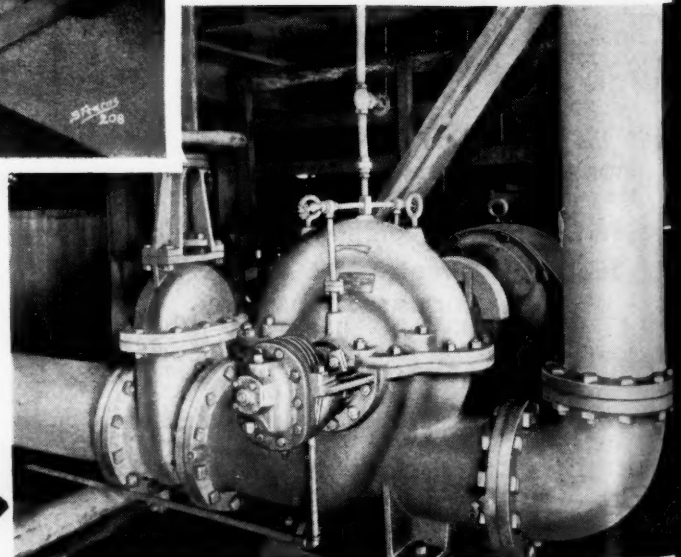
TWO 12" — 2 STAGE HAZLETON

all bronze Mine Pumps. Each rated at: 4,000 G.P.M., 270 ft. head. 1,200 R.P.M. Driven by 400 H.P. Steam Turbines.



10" DOUBLE SUCTION

Recirculating Pump: 2,800 G.P.M., 75 ft. head. 1,150 R.P.M., 75 H.P.



INSTALLATIONS
OF
BARRETT, HAENTJENS
EQUIPMENT AT
HAZLETON SHAFT
BREAKER AND MINE
LEHIGH VALLEY
COAL CO.

Manufacturers of Drainage Equipment for the Mining Industry.
Main Office and Works: Hazleton, Pennsylvania

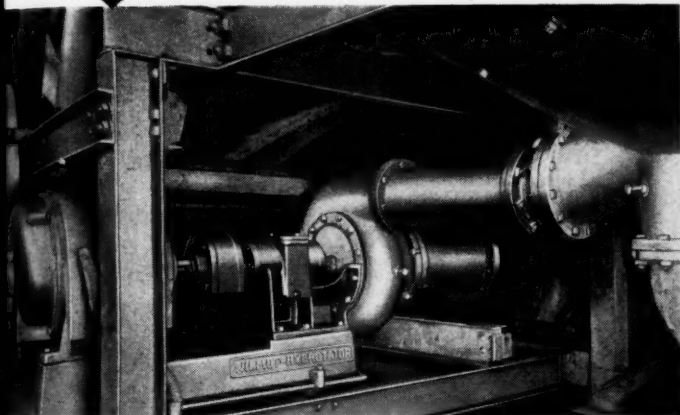
BARRETT

S at HAZLETON SHAFT

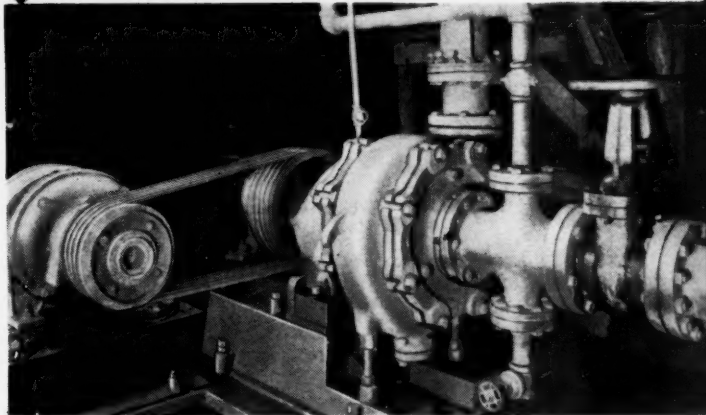
★ For Coal Preparation

THERE IS A HAZLETON PUMP ESPECIALLY SUITED FOR EVERY MAKE OR TYPE OF COAL CLEANING SYSTEM. HERE ARE SHOWN OUR TYPE "CB" PUMP ON THE WILMOT-HYDROTATOR AND OUR TYPE "CT" PUMPS ON THE CHANCE SYSTEM.

↓ **10" HAZLETON TYPE "CB" PUMP**
on Wilmot-Hydrotator System: 3,000 G.P.M.,
30 ft. head, 690 R.P.M., 40 H.P.

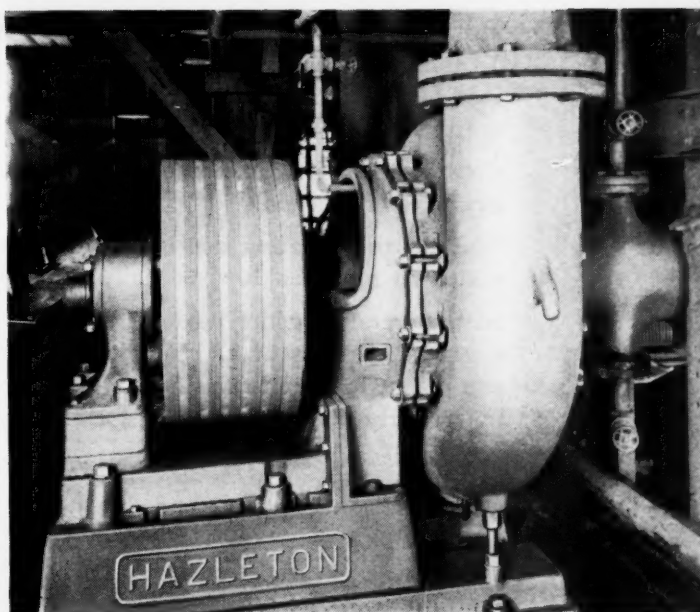
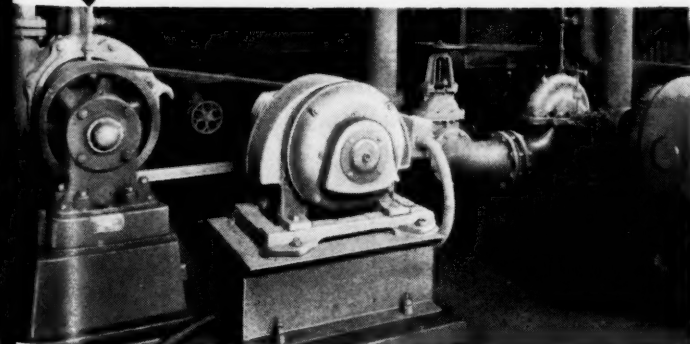


↓ **6" SAND PUMP ON CHANCE COAL**
Cleaner: 900 G.P.M., 46 ft. head, 620 R.P.M.,
25 H.P.



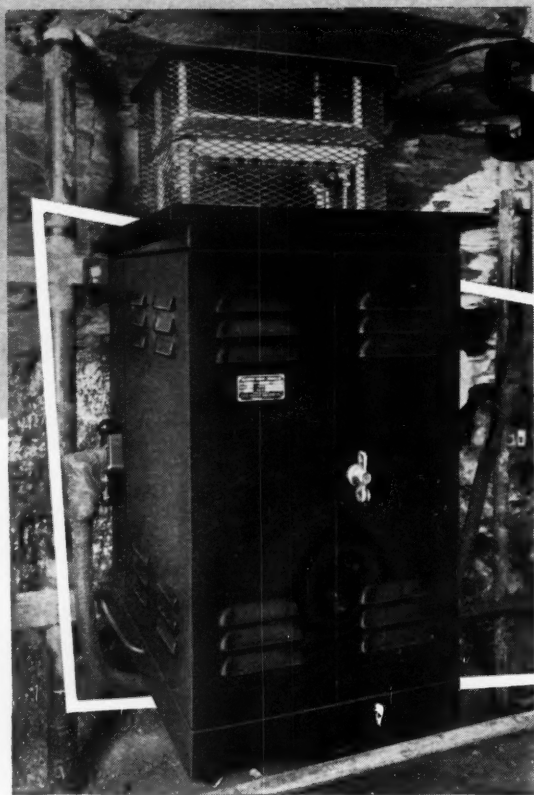
→ **12" SAND PUMP ON CHANCE**
Coal Cleaner: 3,500 G.P.M., 29 ft. head, 360
R.P.M., 50 H.P.

↓ **6" SAND PUMP ON CHANCE COAL**
Cleaner: 900 G.P.M., 23 ft. head, 450 R.P.M.,
15 H.P. **6" DOUBLE SUCTION** Supply Pump:
1,600 G.P.M., 150 ft. head, 1,750 R.P.M., 75 H.P.



Also manufacturers of Motor-Driven Priming Pumps, Hand Primers, Vacuum Breakers, Valves of many types and Automatic Pumping Equipment for the Mining Industry.

T HAENTJENS & CO.



STEADIER Daily Tonnage

with

SECTIONALIZING CIRCUIT BREAKERS

Typical installation underground of a Type KSC
Sectionalizing Circuit Breaker

BEFORE the onset of war, automatic reclosing circuit breakers, Type KSC, were in wide use for sectionalizing service in mines. As war approached, the number leaped and has since continued rapidly upward. The reason for the increase is *the ability of sectionalizing circuit breakers to aid in obtaining peak production.*

When a mine is sectionalized, an electrical disturbance is confined to the area in which it starts. Operation of mining, loading and haulage equipment in other areas is never penalized.

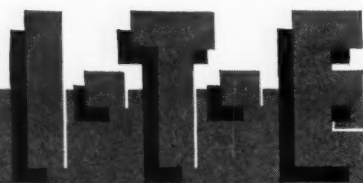
In the local area, where disturbance has arisen, power is restored at full voltage at the instant the fault has been cleared. Not a second of needless loss occurs.

Within each section, the circuit breaker is placed at that spot where electrically it can do its work best. Since protective action is fully automatic, attendance is not a factor in choice of location.

The aid to operating continuity is great. There are mines where sectionalizing has added as much as 10% to daily tonnage.

In the trend to wider use of Type KSC Sectionalizing Circuit Breakers, one point is clear: the circuit breakers are considered by mining men to be primary, fundamental equipment for mechanized mining. Orders are now placed for sectionalizing equipment in the early stages of planning for extension of mechanized operations.

Representatives in Principal Mining Areas



AIR SWITCHGEAR

IMMERSED IN AIR

ENCASED IN STEEL

The Army-Navy "E" for



Production Excellence



CIRCUIT BREAKER CO., PHILADELPHIA, PA.

A Sheave Like This
Will Ruin
Wire Rope

Yes, Even..

HAZARD **LAY-SET**

Preformed



Never install a new wire rope on a worn sheave—to do so invites early failure. When the groove gets too wide, it permits the rope to flatten. . . . And don't try to run a new rope over a groove that is too narrow. That pinches the life out of it.

Before installing a wire rope (even the longer-wearing, easier-handling **Hazard LAY-SET Preformed**) carefully check the condition of your sheaves, using the standard sheave groove gauge. For calculating safe groove diameters, the following table gives the exact extent by which the groove diameter should exceed the diameter of the rope:

For ropes of the following diameters in inches	Groove diameter should be greater than rope by not less than the following fraction of an inch	Groove diameter should be greater than rope by not more than the following fraction of an inch
1/4 to 5/16	1/64	1/32
3/8 to 3/4	1/32	1/16
13/16 to 1-1/8	3/64	3/32
1-3/16 to 1-1/2	1/16	1/8
1-9/16 to 2-1/4	3/32	3/16
2-5/16 and larger	1/8	1/4

Save critical steel by careful inspection and proper maintenance of *all* equipment and by using **Hazard LAY-SET Preformed**—the greater dollar value rope. All Hazard ropes made of Improved Plow Steel are identified by the Green Strand.

HAZARD WIRE ROPE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles
New York, Philadelphia, Pittsburgh, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC.

BRIDGEPORT, CONNECTICUT



TOO LARGE



TOO SMALL

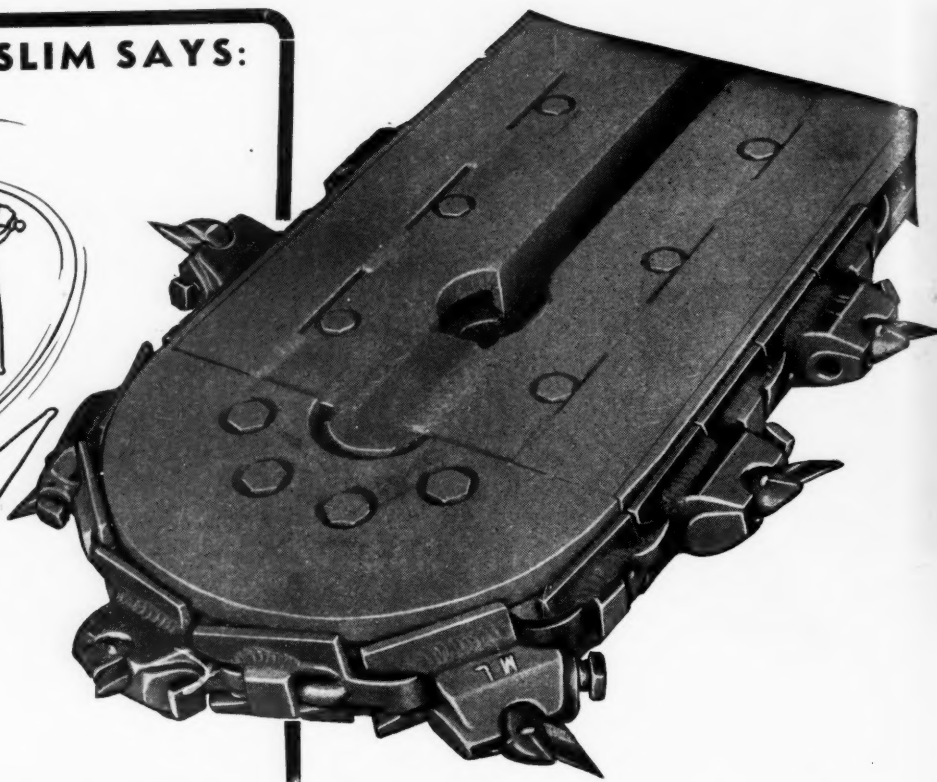


PROPER SIZE

HAZARD **LAY-SET**

WIRE ROPE

GENERAL JIM SLIM SAYS:



"KEEP EQUIPMENT IN 'TIP-TOP' CONDITION"

**A REGULAR MAINTENANCE PROGRAM WILL
KEEP US WORKING LONGER . . .
THE BOWDIL CUTTER BAR, CHAIN, AND ME**

● Present emergency conditions, plus the necessarily increased use of fuel oil by our Navy and Merchant Marine requires that our nation's industries curtail their use of oil. This means that mine operators must deliver more coal in a shorter time than ever before, to meet these added industrial demands. Apparent then, is the fact that every slowdown, because of worn or broken tools, must be avoided; and the only way this can be economically accomplished is with a regularly scheduled maintenance program; one that includes frequent inspection and continuous repairs wherever needed.

In view of these conditions, we have listed, at the right, several suggestions for maintaining your Cutter Bar, Chain and Me. Our catalog gives full particulars; send for it today.

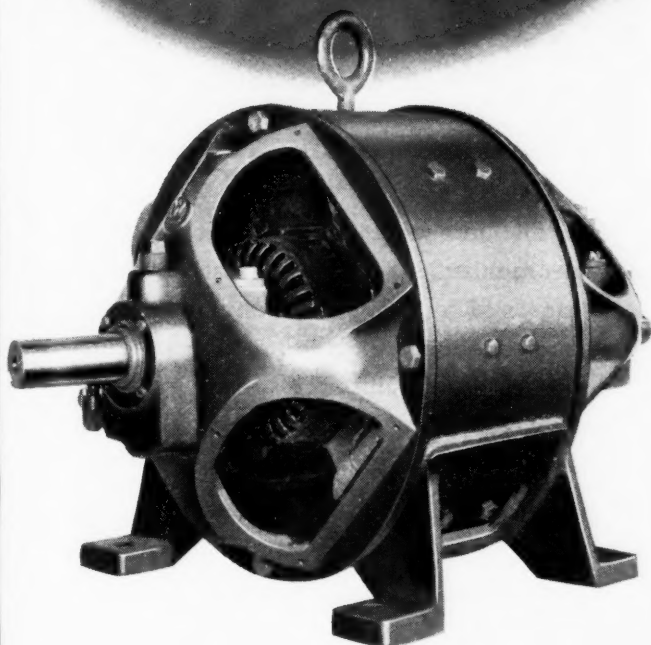
The BOWDIL Company
Canton COAL CUTTING EQUIPMENT Ohio

1. **SAVE STEEL!**—Distribute cutter bits from supply house and require all bits to be returned for inspection before scrapping. Bits turned in with only one point unused or not fully worn out should be sent back for further use.
2. Oil cutter chain at least after several places have been cut, and always upon completion of shift.
3. Tighten bits properly and reduce bit loss.
4. Keep cutter chain adjusted $\frac{3}{4}$ " slack under frame in most cases.
5. Be sure cutter head is tight. When worn or too open, report to maintenance authority.
6. Don't operate chain unnecessarily when not actually cutting coal. This practice is a safety hazard and wastes steel by dulling bits.
7. Use care in setting jacks so bits will not strike them.
8. Bowdill Cutter Bars and Bits cut a thinner kerf, less fines; save power and reduce wear and tear on machine motors and gears.
9. Keep us advised of your requirements well ahead of actual needs.



*To mine operators
buying new
motors!*

**MORE WESTINGHOUSE SK
MOTORS ARE USED IN COAL
MINES TODAY THAN ALL
OTHER MAKES COMBINED**



Here are **3** reasons why:

1. Westinghouse SK Direct-current Motors are built to stand up under grueling mine service. They are built tougher than the toughest job they will be called on to do in spite of dust, grit, grime and moisture. Directed ventilation, sealed-sleeve bearings, breakdown-proof insulation and rigid construction are typical construction features which have been tested and proved in more than 30 years of mine service.

2. Parts for today's improved SK Motors are interchangeable with any of the previously-built SK Motors of the same rating. Problems of servicing and of stocking spare parts are simplified. As a result, more and more operators are taking advantage of standardizing on Westinghouse for all motor-driven operations.

3. SK Motors are available from 1 hp to 200 hp with the proper performance characteristics and enclosures for every type of service from pumping and cutting to hoisting and conveying. All have earned first place with cost-conscious management on the basis of tons-per-dollar. All have won first place with production-minded operators on the basis of tons-per-hour.

When you add new motors to your mining equipment, be sure to get all the facts about SK Motors from your nearest Westinghouse representative. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., Dept. 7-N.

J-21213

Westinghouse

SK Mining Motors

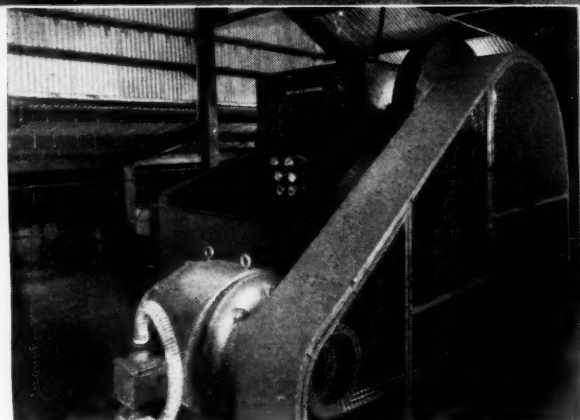
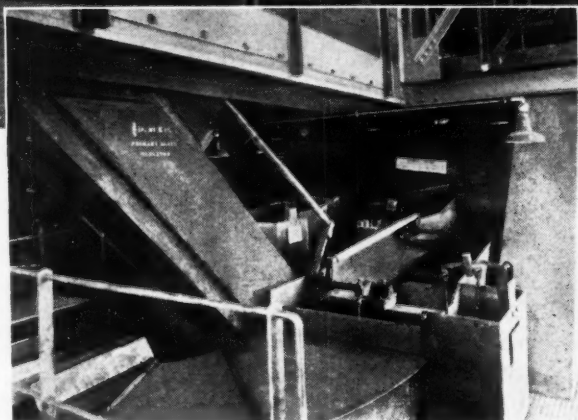


Another mine gets
**"A PLANT ENGINEERED
 TO ITS NEEDS"**

MUSE MINE NO. 3

This plant was designed to handle 500 tons per hour of 4" x 0 or 6" x 0. Lump coal may be crushed to these sizes and cleaned if desired. Raw coal feed is sized into 4" or 6" x 1 1/4", 1 1/4" x 3/4", and 3/4" x 0. The two larger sizes are washed separately in Tandem launder type Hydro-Separators and the 3/4" x 0 is by-passed raw. Middlings from the Hydro-Separator washing units is crushed and recleaned in a standard Hydrotator unit.

Washed coal is sized and dewatered on a Parrish type shaking screen, with secondary dewatering of the 3/4" x 3/4" on a high speed vibrating screen. The washed products may be loaded separately as individual out sizes, or reassembled and loaded in combination.



500 TONS AN HOUR of prepared coal—cleaned and uniformly sized: that's the pace in the modern R & S plant at Muse Mine No. 3 of the National Division, H. C. Frick Coke Co., subsidiary of U. S. Steel Corporation.

Mine after mine joins that march to modernization—as alert executives, studying what lies ahead, see that only Prepared Coal will compete in tomorrow's markets.

Many operators, mapping their programs, turn instinctively to Roberts and Schaefer.

They find here what they most urgently desire—an organization whose technical knowledge is seasoned by broad first-hand experience; an organization free of bias as to preparation methods; an organization whose practical insistence is that equipment be right for the job, and that it perform efficiently, at low cost.

Getting information on how Roberts and Schaefer Company can help you is good business—costs nothing, worth much.

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5 WAYS TO GET HELPFUL INFORMATION FAST...

...ON HAZARD ELECTRICAL CABLES FOR EVERY MINING USE



HAZARD INSULATED WIRE WORKS

DIVISION OF THE OKONITE COMPANY

Works: Wilkes-Barre, Pa.

Offices in Principal Cities



1

Hazard Coal Mining Catalog . . . Crammed with illustrations, this fact-filled book contains all essential information on Hazard Cables and their best uses to obtain the most efficient electrical mining operations. If you have no copy, write for it today. You will find this catalog invaluable.

2

The 1942 Coal Mining Catalog . . . On pages 163-166 of McGraw-Hill's catalog, you will find condensed facts for quick reference on the various types of Hazard Cables available.

3

Your Hazard Representative . . . This long experienced Hazard man lives near you, call on him for help without obligation in the selection of the right cable for any job in your mine.

4

Hazard District Offices . . . Write, telephone or telegraph the nearest following office. It is there to assist you.

Atlanta, Ga.	1606 Rhodes-Haverty Bldg.	Los Angeles, Calif.	2450 Hunter St.
Birmingham, Ala.	1520 Comer Bldg.	New York, N. Y.	501 Fifth Avenue
Boston, Mass.	1100 Statler Office Bldg.	Phila., Pa.	Broad Street Station Bldg.
Buffalo, N. Y.	44 Victoria Blvd., Kenmore	Pittsburgh, Pa.	1317 Gulf Bldg.
Chicago, Ill.	20 No. Wacker Drive	San Francisco, Calif.	1664 Russ Bldg.
Cleveland, Ohio	316 Cleveland Railway Bldg.	Seattle, Wash.	801 Northern Life Tower
Dallas, Texas	P. O. Box 694	St. Louis, Mo.	1410 Shell Bldg.
Detroit, Mich.	1709 Ford Bldg.	Washington, D. C.	547 Munsey Bldg.
	Wilkes-Barre, Pa.		72 Hazle St.

5

Your Supply House . . . They are ready any time to furnish specifications, prices or any help possible to make sure you get the right cable for the right job. No obligation, of course.

For over 40 years, Hazard has specialized in making electrical cables to meet the exacting requirements of your mining industry. You will find Hazard Cables designed especially for each type of mining requirement. Choose any one—you can be sure that it will add the utmost safety, economy and efficiency to the particular job for which it is built.

3207

HAZARD WIRES AND CABLES FOR EVERY MINING USE

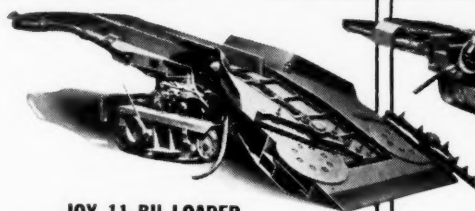


PUT JOY EQUIPMENT ON THE JOB

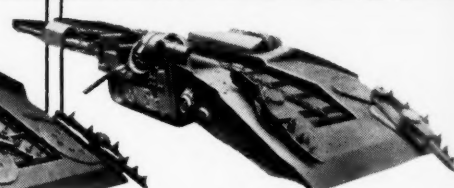
**Joy Equipment is
carefully built to
stand hard wear!**



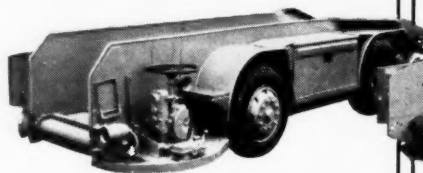
Every piece in JOY Equipment is made by skilled workers and factory-tested before it leaves the plant.



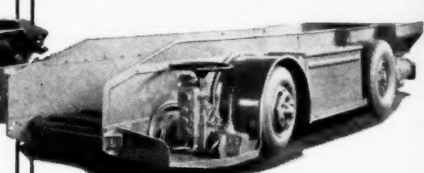
JOY 11-BU LOADER
A heavy duty machine of high capacity,
8-10 tons per minute.



JOY 14-BU LOADER
A high capacity low vein machine . . . only
26" high . . . 5 tons per minute.



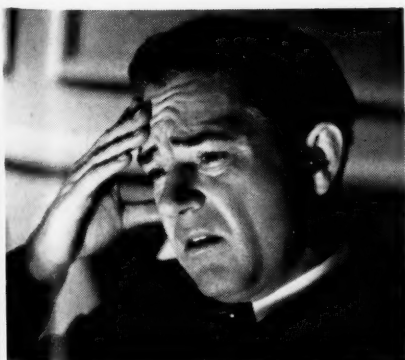
JOY 42-D SHUTTLE CAR
PERMISSIBLE TYPE
5 ton capacity for average height seams.



JOY 32-D SHUTTLE CAR
PERMISSIBLE TYPE
3½ ton capacity for low seam operation.

"YES SIR- JOY SAVED THE DAY FOR ME"

Many years ago JOY pioneered in mechanized coal loading and mobile hauling. Today mining men throughout the world recognize the savings and advantages of JOY Equipment.



Worried about your output?
—put it up to JOY

Increase your
tonnage output
the modern
way

JOY
MANUFACTURING COMPANY
FRANKLIN, PA.



*Call in
a Joy
Engineer*

WAR WORK .. *Nazi Style*



OFF to Nazi-land, forced to labor in a mine under the cold eyes of a brutal guard! Perhaps an ill-timed blast will end your misery . . . for life is cheap in *War Work, Nazi Style*.

Not so—over here. A vast army of men are devoting themselves by choice to the task of supplying war-time's tremendous demand for coal, iron, copper, stone. . . . This is *War Work, American Style*—and every life is valuable. For the man who can safely blast down tons of ore is an essential worker in *your* fight for freedom.

We are making Ensign-Bickford Safety Fuse for these men—making it with all the precise care and skill acquired in 106 years of fuse manufacture.

Victory begins underground!

THE ENSIGN-BICKFORD CO.
SIMSBURY, CONNECTICUT



Ensign-Bickford
Safety Fuse

Mining—Number One War Industry

*The mineral products of the earth are the
prime necessities of war...and peace*

THE SURFACE of the earth provided primitive man with the things he needed for his meager existence but civilization really began when he became curious about its interior. This curiosity has brought us a long way. For the earth has yielded — out of its deep recesses — all the raw materials of modern industry. And today, in the grueling race of production, our mining industry is providing the raw materials upon which depends our survival. Our mines and quarries must supply a long list of materials without which a successful war cannot be fought.

Take steel, for example. War without steel is inconceivable. Steel starts with iron ore, limestone and coke. These are products of mines and quarries. It takes power and heat to get these materials out of the ground, to refine them and to transport them to the point where processing begins. All the subsequent operations culminating in the steel ingot, shape or plate, and in moving the final product to the point of use require power and heat.

The major source of this power and heat is coal.

Production of a ton of steel, it has been stated, requires two tons of coal. Smelting of the pig iron alone, 60,000,000 tons in 1942, required the coking of some 75,000,000 tons of coal. Pig output is expected to rise to 68,000,000-70,000,000 tons in 1943, carrying coal consumption up to 85,000,000 tons. At the same time, output of steel ingots is expected to rise from 87,000,000 to 97,000,000 tons. Think what this means in terms of power and heat.

Another vital metal is copper. Modern armies need copper. This point is dramatically illustrated in a recent memorandum by Robert P. Patterson, Under Secretary of War, in announcing the release of 4,000 men from military service to return to the mines and increase copper production. "In a single minute of combat", Mr. Patterson declared, "a flight of 50 fighter planes shoots away 7 tons of copper. A 37-mm. anti-aircraft gun uses up a ton of copper every twenty minutes it is in operation. Six hundred pounds of copper go into every

medium tank, and a ton into the engines and air-frame of a Flying Fortress. The Signal Corps alone needs 5,000 tons of copper every month for radio and telegraphic and telephonic equipment. An army without copper would be an army without speed, maneuverability or firepower. It would not last a day in battle".

Seven tons of copper for one minute of combat by 50 fighter planes means from 200 to 700 tons of ore, depending upon its grade. Small wonder that the War Department was willing to release drafted miners from military duties to produce more copper.

But other metals are equally important in war: tungsten, nickel, manganese, chromium, vanadium and molybdenum for alloy steels; zinc for brass and die castings; tin for bronze and bearings; aluminum and magnesium for aircraft; lead and mercury for ammunition; silver for electrical equipment, bearings and solder, and so on. Even relatively insignificant non-metals, like mica and diamonds, suddenly assume critical importance.

And let us not lose sight of the fact that without adequate energy, i.e., heat and power, production, processing, transportation and the relative comforts to which we have become accustomed would be impossible under war conditions. Coal is the major source of energy in the United States. It supplies more than half the total in normal years.

The railroads of the country alone used 110,000,000 tons in 1942 to move freight and passengers and service their facilities. Utilities consumed over 68,000,000 tons in the production of electric power. Over 135,000,000 tons of coal were consumed last year in maintaining the level of heating comfort necessary for the maintenance of efficiency and morale. The consumption, this year, will be even greater.

In short, the mineral products of the earth are the prime necessities of war.

The nations that control the world's mineral resources and make the most efficient use of them will win the victory.

Before the war, the British Empire and the United States together controlled probably 75 per cent of the world's mineral production. This would have been a most potent weapon in the United Nations' arsenal if the whole strategy of Axis expansion had not been influenced by mineral objectives. Addressing the American Zinc Institute on the subject last April, E. W. Pehrson, of the U. S. Bureau of Mines, estimated that the Axis had improved its position in world mineral resources in the following percentages: iron ore, from 6 to 46; steel production capacity, 20 to 34; petroleum, 1 to 7; coal, 27 to 53; copper, 5 to 10; lead, 7 to 22; zinc, 16 to 27; tin, 1 to 72; manganese, 2 to 30; chrome, 3 to 30; tungsten, 6 to 60. In the light metals, areas now Axis-controlled produced in 1940 54 per cent of the world's aluminum, 49 per cent of the bauxite (the principal source of aluminum) and two-thirds of the magnesium.

Despite these gains, the industrial war power of the United Nations still can outweigh that of the Axis by a considerable margin. It already has begun to surpass it. The problem is to convert quickly our potential mineral resources into implements of war. In this conversion, a heavy burden of responsibility has been placed on the mining industry of the United States as the largest producer of many metals, minerals and fuels. In fact, the United States mining industry began to go on a war basis a year before Pearl Harbor. The curves of demand for domestic copper, lead, zinc and other metals began to rise sharply in 1940, and were paralleled by a rising coal production.

How well the job has been done cannot be revealed in accurate figures in many cases because of censorship. In metals, however, some idea of production gains can be indicated in comparative terms. United States copper production, for example, is breaking all previous records. Aluminum capacity will be more than seven times its annual peace-time average. Magnesium plants now building will have a capacity 100 times the largest yearly

before-the-war figure. Molybdenum, of which the United States has the largest single mine in the world, is being made available in record quantity. Zinc, lead and mercury are surpassing expectations in meeting wartime demands, and tungsten, chromium, manganese, antimony and iron and steel are being turned out in record-breaking quantities.

Bituminous coal production in 1942 was 580,000,000 tons, the greatest in history, valued at more than \$1,300,000,000 at the mine. Some 430,000 or more men were employed in 1942 and received at least \$750,000,000 in wages. Bituminous production in 1939 was 394,855,000 tons, while the output for 1943 is forecast at approximately 600,000,000 tons — another new United States record. The 1942 anthracite output was 59,961,000 tons, valued at over \$270,000,000 at the mine. The industry employed some 85,000 men and paid out at least \$180,000,000 in wages. The 1939 production of anthracite was 51,487,000 tons, and the forecast for 1943 is

65,000,000 tons or more.

Marshalling the Western Hemisphere's mineral resources, the United Nations have been the beneficiaries of the diversified resources of two continents — in particular of Canada's nickel and coal, Mexico's lead and antimony, Chile's copper, Bolivia's tin, Peru's vanadium, Brazil's iron, and Venezuela's petroleum. With other United Nations contributing their share of metals and fuel, the grand total is an impressive array of potential munitions and matériel to lend assurance of certain victory over the Axis. Sheer weight of metal, properly used, will win the war, and our mineral industry will have played an indispensable and essential part in the inevitable outcome.



President, McGraw-Hill Publishing Company, Inc.

This is the eighth of a series of editorials appearing monthly in all McGraw-Hill publications, reaching more than one and one-half million readers, and in daily newspapers in New York, Chicago and Washington, D. C. They are dedicated to the purpose of telling the part that each industry is playing in the war effort and of informing the public on the magnificent war-production accomplishments of America's industries.

FEBRUARY 1943

COAL DELIVERS

COAL measured up well to its responsibilities in 1942, and in that fact the entire industry—management and men—can take pride. Despite natural and expected difficulties in equipment, materials and manpower, coal met all demands for its product and built up one of the biggest stockpiles in history, in addition to taking over the load dropped by oil and natural gas.

With adequate transportation, such as prevailed last year, and the continued cooperation and assistance of government agencies and manufacturers, there seems no reason, barring unforeseen troubles, why coal cannot go on to reach the 1943 objectives of 600,000,000 tons of bituminous coal and 65,000,000 tons of anthracite, despite the increased difficulties which the conduct of the war will put in its path. That these difficulties will not be greater reflects credit for the hard work done in 1942 to prepare for the future.

With the first full year of World War II again demonstrating coal's position as a basic industry in war, as well as in peace, the industry was accorded appropriate priority assistance in obtaining equipment and materials. At the same time, management and men channeled their efforts toward getting more out of what was on hand or could be acquired. Thus, active installation of new mechanical-mining equipment was supplemented by the adoption of modern auxiliary equipment and up-to-date working methods.

One result, coupled with the attitude of government officials and especially the War Production Board, was to put the brakes on any tendency toward a mushroom growth of new mines, a feature of World War I that caused the industry untold grief in the years that followed. The policy of restricting opening of new mines only to those needed for specialty coals, such as the coking variety, or to safeguard the interests of certain consumers and regions augurs well for a healthy and stable future.

Another factor portending a healthy future was the continued and increased interest in product improvement and research to make coal more efficient and ex-

pand its field of use. While the war necessarily had its effect on preparation improvements and research work there was no lagging in interest, and in the field of research, particularly, several projects were set in motion, while more work was devoted to others, that should pay off handsomely in the future. Manufacture of liquid fuel and improved methods of producing gas from coal are among those that might be cited, along with continued study of ways and means of making coal more efficient when burned in present equipment, paralleled by investigation of how present coal-burning equipment might be improved and new types developed.

While destructive by nature, war also stimulates invention and adoption of new or more efficient practices. Thus, for coal mining, as has been stated, it has meant greater pressure for up-to-date methods of cutting, shooting, loading, hauling and preparation of coal, as well as ventilation, pumping and drainage and power supply. And while it has made the problem more difficult, war also has focussed increased attention on the subject of safety, inasmuch as accidental injury or loss of life, while bad in peace, is even worse in war, when every available ounce of effort counts.

War also has made mandatory the swifter adoption of materials conservation measures that will prove of continuing value after the cessation of hostilities. It has, in addition, spurred the search for substitute materials and methods, many of them better than the original and in line for permanent adoption. And, last but not least, war has brought more firmly into the spotlight the vital necessity for keeping equipment operating, meaning better maintenance. The results will be of lasting benefit.

The developments of 1942 summarized in the following pages of this Review and War Progress Number, to sum up, provide a solid foundation for progress. Coal, however, does not intend to rest on its oars, and faces the future with confidence that it can do the job which devolves upon it as a basic industry in war as well as in peace.

ANTHRACITE WILDCAT

How Deep Did It Scratch?

By WHITING WILLIAMS



BACK TO WORK, BUT . . .

Aemo Photo

Was anything settled? After three weeks of idleness, striking miners in District 1 take up their tools again, leaving the questions of dues, more wages and more consideration from their own international officials still open. Their chief comfort was John Lewis' promise that he would get them a "wholesome" pay increase next May.

DID SOME 17,000 anthracite miners march up the hill to stage the country's worst labor stoppage since Pearl Harbor merely because they hated to put 50c. more per month into their union treasury? Or did they cold-bloodedly figure that they could get \$2 more per day if they had the guts to break their contract and withhold half a million tons of precious fuel at a time it was needed most?

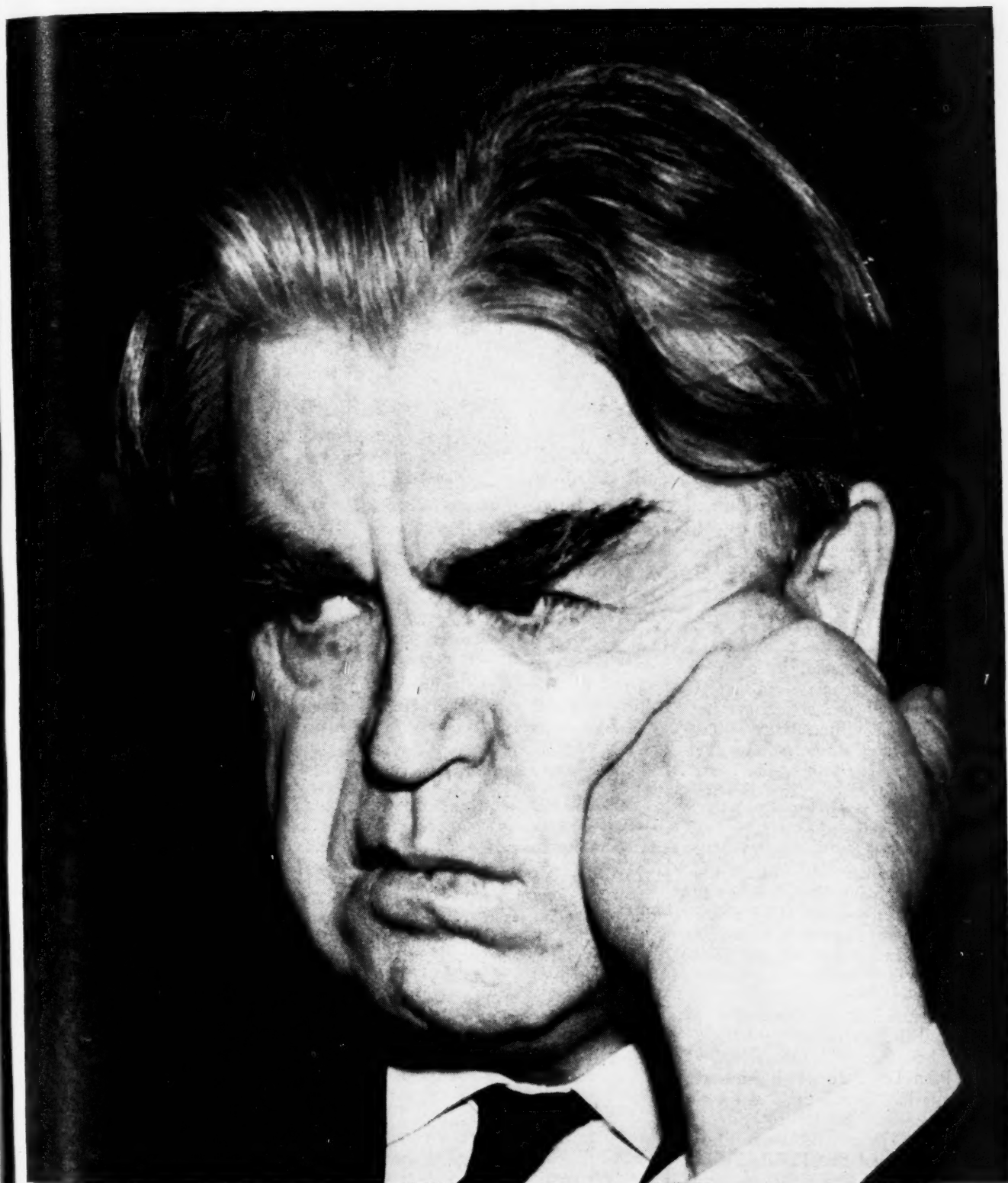
No, it's hardly as simple as either of these, not by a shovelful.

Did the same 17,000 miners, three weeks later, march down the hill and, minus a million or two in lost wages, start producing again while they close-harmonized on "Let's let the whole thing drop"?

By no means. It's a long, long way from being as elementary or as reassuring as that. On the contrary, this particular war-time wildcat may inflict some nasty scars on a number of cows held more or less sacred in our various coal fields and also throughout the country's entire field of industrial relations.

But first about the cat itself. What made it so wild—and so sudden-like?

I have just come from putting that question to operators in their offices and to miners in both their leisure spots and their working places in the Wyoming Valley, where, for a disquieting number of days, the aggravated animal ran loose. The answers make it impossible to talk much of either simple causes or sudden. It was in September, 1941, that much the same complex irritations made some 20,000 miners march and picket in the nearby Panther Creek Valley against checking-off international and local assessments totaling an extra \$1



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"NOT CHANGED, BUT LURED AWAY BY STRANGE GODS . . ."

John Lewis still ranks high in the estimation of anthracite miners despite their distrust of his mixing in politics and their resentment at what they feel is his tendency to treat them as step-children. The dues question notwithstanding, they still look upon him as the best man to lead them. But they wonder where he is going and why, and fear what

they think is a tendency to make excursions into strange and unrelated fields. And operators, government officials and the public, as well as labor in general, wonder if his present course will not lead to further explosions, upsetting of established relations, loss of respect for union agreements, further embroilment in politics and—even—inflation.

monthly. That makes it all the easier to believe that the specific immediate cause of last-month's rampage the detonator that exploded a whole series of latent charges, large and small—was opposition to the deduction of that extra 50c. voted at the Cincinnati convention last October.

That vote meant a net annual increase of only \$4, as it carried with it the elimination of assessments lately aggregating \$2 yearly. The voted money, furthermore, was for a purpose highly approved by the great majority of miners—a war chest for resisting attacks which most unions now expect employers to make the moment peace arrives. The strikers' later demand for higher wages also is easy to understand. Although their hourly earnings average \$1, their short week, hailed though it was, especially during the depression, makes their pay check much less than relatives and friends, with overtime, are taking home from shipyards and other war industries. Various other war conditions are making that hourly \$1 pretty unsatisfactory when multiplied by 35.

Why He's Touchy

Here's how a banker in a small anthracite town put it: "At best, a 4½-week month makes a total average pay of \$157.50. From that, public and worker opinion here requires the deduction of 10 percent for war bonds. Then 5 percent for the current Victory Tax. And another 1 percent for Social Security. Then, of course, \$1.50 for the union. On top of that, and most irritating of all, the man's cost of living has gone up at least 20 percent—much higher on food. That's why everybody, both employers and union leaders, are finding the miner hereabouts unusually 'touchy.'"

Less obvious but very important is this: to all the preceding "something new has been added" by the split between John Lewis and Phil Murray. That split has forced every national and local leader, from top to bottom, to make his choice. Although there appeared no proof that Phil had sent in trouble-making emissaries, nothing is plainer than that this family quarrel has resulted in a big total of official changes, distrusts and uncertain loyalties to dangerously weaken the entire union structure.

Add to these difficulties the demoralizing depression years of work shortage and you have a lot of explosive lying around waiting for somebody or something to push down the handle. Even so, how could a mere \$4 additional dues provide that push

Anthracite Strike Time Table

PRE-STRIKE DEVELOPMENTS

SEPT. 8, 1941—Some 20,000 miners in District 1 strike against increased dues and assessments. Stoppage ends Oct. 4.

MIDSUMMER, 1942—Two anthracite locals ask for reopening of agreement and wage increase. Unsuccessful attempts made to get charter for "Tri-District General Mine Committee" from United Mine Workers.

SEPT. 28—Solid Fuels Coordinator Ickes asks longer work week.

OCT. 14—Dues increase of 50c. a month (\$4 annually for anthracite) voted at United Mine Workers' convention.

NOV. 2—First attempt to operate sixth day under terms of existing agreement fails when miners refuse to come out.

DEC. 8—Longer work week agreed upon when new prices are granted.

STRIKE HIGHLIGHTS

DEC. 30, 1942—Some 1,300 men strike at the South Wilkes-Barre colliery, Glen Alden Coal Co., over increased dues.

JAN. 6, 1943—Seven collieries down, two partly down, some 9,000 men out in Luzerne County (District 7). Wage increase of \$2 per day more to the fore in miners' demands. Ickes asks end of stoppage. Thomas Kennedy, U.M.W. secretary-treasurer, intervenes. OPA grants 50c. per-ton price increase, effective Jan. 6. Strike continues. Daily tonnage loss estimated at 20,000.

JAN. 10—"Tri-District General Mine Committee" says sentiment in Districts 1, 7 and 9 has been polled and general strike will be called unless \$2 a day wage increase is granted.

JAN. 11—Some 5,000 miners return while talk of general strike swells. Secretary of Labor Perkins certifies dispute to War Labor Board. Cut in daily output placed at 30,000 tons. Strike continues.

JAN. 12—War Labor Board demands end of strike. Men prepare to vote. Cut in daily output placed at 40,000 tons. Strike continues.

JAN. 14—With most locals voting to continue strike, the War Labor Board sets hearing Jan. 15. "Tri-District" committee calls off general strike. Some 17,000 men reported still out.

JAN. 15—War Labor Board orders end of strike forthwith and promises to take up grievances in regular procedure after hearing international union officers, delegates from locals and company officials. Representatives of 22 locals rail against dues increase, present wage rates, union policies and lack of consideration by international officers. Kennedy terms strike "a terrible mistake." Lewis warns board it has no power to set aside a bona-fide union agreement and serves notice he will seek a "wholesome" wage increase when present agreements expire. Following the board's decision and a meeting with Lewis, local delegates vote to recommend that strike be ended.

JAN. 17—Strike continues, with the majority of the locals in Luzerne County voting against a return to work because nothing had been done about their demands. "Tri-District" committee dissolved.

JAN. 18—Strike referred to the President by the War Labor Board. Some 19,000 men and 16 collieries still idle in District 7.

JAN. 19—President Roosevelt gives strikers 48 hours. "As commander in chief of the armed forces I direct all miners in the anthracite coal fields that are now out on strike to return at once to their jobs of producing vitally needed coal for their country. If this order is not complied with in 48 hours," the President declares, "your government will take the necessary steps to protect the security of the nation against a strike which is doing serious injury to the war effort." Union officials threaten expulsion for failure to return.

JAN. 22—Strike practically at an end by the noon deadline. Two locals reported still out but expected to change votes and return.

and persuade 17,000 men to break their precious contract, pass up two or three weeks' pay, refuse the pleadings and orders of their Big Boss, be called traitors or near traitors by millions of their fellow-citizens and finally return to work only at the request of their idolized friend, their country's President?

The reason, as I see it, is that relations between union members and union leaders, like those between employees and employers, are made up of a lot of items—explosive items—besides logic, dollars and cents and arithmetic. The biggest reason for this explosion, as for many similar explosions, was hurt feelings. The feelings of the district's miners have long been wounded not by their employers but, believe it or not, by their union leaders or, more precisely, their union leader! Not absentee management but, instead, absentee unionism—the failure of John Lewis to keep in proper touch with his anthracite members—is what turned the Wyoming Valley wildcat loose.

Wounds Are Old

Those hurt feelings are considerably older than mere war babies. Over the past several years it has been easy for the casual visitor to perceive that, in the opinion of hard-coal miners, their union's head had come to consider his official bread buttered by his big five-to-one bituminous majority. For more than a generation, the district has held in fond affection the memory of Lewis' predecessor, President Mitchell. Today, no visitor can avoid hearing that "John Lewis doesn't dare show his ugly face up here!"

"If," declaimed a miner in a Wilkes-Barre saloon, "we accepted that phoney vote for this 50c. a-lyin' down, what's to prevent him takin' another slice next time? Where'll he stop? If he wants more than the six or seven million dollars in his treasury now, why don't he get back some of all that money he handed over so free and easy to the President and the CIO, or else quit usin' our dollars to help his District 50 raid a lot o' railroaders or organize a bunch o' farmers we don't give a damn about?"

"From union," complained a Polish miner, "we doan get noddin. Dollar and half, dat too much. If Lewis gat feefy cent, dat enough for wat we get."

Such sentiments, as freely expressed in the Valley and also at the Washington hearing, find abundant support in the district's partial spotty strike. Nevertheless, it is a serious error to assume that Lewis is finished as an anthracite leader. Most signifi-



WHITING WILLIAMS is a man unusually well qualified to present the accompanying report on January's wildcat anthracite strike. Believing its implications to be so important as to merit the

most thoughtful consideration not only by coal operators but by all American industry, the editors of *Coal Age* therefore asked him to interpret its significance in the light of his broad knowledge of industry and labor problems.

As a leading writer and consultant in industrial relations, Whiting Williams has earned his insight into the worker's mind the hard way. He has loaded coal in the mines not only in America but also in the Rhondda Valley of Wales, in North France and in the Ruhr and Saar valleys of Germany. He writes, therefore, from the viewpoint of one who knows the specific problems of industry from both sides of the fence. It is this quality which has given him a reputation for authority and impartiality equally acknowledged by both management and labor the country over.

cantly, even those who call him the worst names are likely to add, after they have "blown off" and paused for breath, "Why in hell don't he come up and talk it over with us?"

To be sure, it poses a hard choice for these troubled workers—a choice between loyalty to their beloved President and at the same time retention of their ancient confidence in his enemy, John Lewis. But just as they lately went to Washington perfectly certain that the President would fix everything as soon as they told him their troubles, so they also indicate to the careful listener that John has neglected them, not because he has suffered some fundamental permanent change but simply because he has temporarily been lured away from them by political or other strange gods.

The fact is that for a long span of years, John Lewis has personified that unionism without which they would feel completely lost. For too many years their self respect has been anchored to his repeated assurance that "We diggers of coal constitute the shock troops of the great army of labor. With our slogan of 'No backward step' we move forward to advance positions in full confidence that we are making possible a higher standard of living for all our country's toilers."

So what these hard-coal diggers

want is neither the end of unionism nor of Lewis—the two have too long been synonymous—but more self-government, more autonomy, more freedom from the compulsions of that big unbreakable bituminous majority. But as long as 71,000 anthracite workers refuse to walk out with their 17,000 brethren, it is safe to believe that the great majority want it under Lewis, but a Lewis closer to them and talking in language less sprinkled with ten-dollar words like "accouplement," a Lewis less intolerant of their protector Franklin D. and their old friend Phil and his CIO.

The Need Was There

The surprising thing is that Lewis has not long ago responded to the hankering of his old admirers and made more effort to regain their loyalty. Even his well-known tendency toward autocratic domination can hardly have kept his lieutenants, his anthracite district leaders, from relaying the urgent local need of his long-famous ability, if not to make friends, at least to influence people. Certain it is that more than a few operators have not hesitated to tell him forcibly that he should take the trouble to learn "What goes on here."

"We told him," so these report, "that the instant we showed that increased check-off on our pay checks

he'd have another strike on his hands. When he laughed it off, we told him we knew his local members a lot better than he did. We were right and he was wrong."

"We independents," one of them told his associates, "are doing a lot of things to our workers we shouldn't. John Lewis is the only man that can stop that. He'd do it in a minute if he knew. Why doesn't he keep closer?"

He did send his investigators in more than once. Whether these discovered it or not, nothing is plainer than that anthracite's economic troubles, dating back to even before the Great Depression, were resulting in all sorts of demoralization.

The bootleggers and their unbelievable lawlessness, among other things, must have been demoralizing to both employers and union leaders. But as serious a threat to local unionism was another depression-spawned practice growing out of price-cutting accompanying the cut-throat struggle for business. I mean the way many companies made deals with various leaders and locals to lower wages and other-

wise cut corners in secret contracts, or even refused any contract at all to men who either had to dig or starve. Thus, during the years when its president was busy with his CIO and his national politics, the union was helping neither its anthracite members nor the operators. Instead of working to secure that stability of wages and prices which had been its chief reason for existence, it was condoning by silence and inaction practices tending to sap the lifeblood of the anthracite industry.

Small wonder that men who lived through the difficult times their industry experienced after 1925 should feel hurt that never or almost never during the long years of their affliction did their leader appear—the leader whose intelligence, honesty and forcefulness had brought them salvation in the better times long since gone. Or that men should feel that in a country fighting for world democracy the time had come to demand a greater measure of self-rule. Even if that looked like treason, it would be worth while if it brought relief from their miseries.

Wildcat Leaves, Scars Remain— What of Their Future Effect?

SO THE anthracite wildcat had its day in the valley while people shivered in the great cities to the East. Now it has gone, but are its scars disappearing? Not all of them. Some are likely to remain a long time.

Take the matter of the closed shop. Surely it is not too much to say that this is one of labor's sacred cows. Some millions of workers far removed from eastern Pennsylvania's hills must certainly be observing that, on occasion, it catches them in a tragic trap. As long as the members trust their leader, the discharging of the disloyal "hitch-hiker" and "parasite" appears a price worth paying for the unity, or appearance of unity, it brings. But what if their leader, after years of acceptance, loses contact with those who "made him? What can they do about it? They can refuse to pay their dues. They can break the agreement which for years they had hailed as the sacred instrument of their power and preeminence. They can strike—and refuse their leader's appeals and orders to take up their tools again. But, all the same, the instant he threatens to cancel their membership in their closed-shop union and their closed-shop industry, they can only choose

between returning to work and seeking their living in fields in which they have neither experience nor skill.

That anthracite wildcat pretty surely scratched deep in the tough hide of closed-shop unionism.

Then there's that other sacred cow of all those highbrows who for years have made fun of Bill Green for following old Sam Gompers and pushing his A.F. of L. no deeper into national politics than developments compelled. If you ask even the least thoughtful of John's hard-coal members just why they're now afflicted with absentee unionism you'll get your answer quick and short, no beating about the bush: "politics."

All things considered, John could hardly be blamed for leading his big CIO secession. Grant him sincerity in his motto: "Our sacred duty is to organize the unorganized!" Nevertheless, around Scranton and Wilkes-Barre and down in the Panther Creek Valley and beyond, you'll find many to agree that this one word "politics" tells why John and Phil are not good friends today and why their whole house of anthracite unionism is now weakened by conflicting loyalties. They'll also tell you that each of these

two leaders has suffered loss of power for helping labor in losing the other. "Together they had the world by the tail, but not separately!"

And, down in Washington, there's a fair chance that secretaries in the White House and members of the Labor Board are all but shivering as they wonder just what would have happened if the wildcat had not stopped at the President's request. Suppose soldiers had been sent in. The miners laugh at the amount of coal their bayonets would have dug while they stayed outside to watch the fun! Or supposing, as more likely, the soldiers had stayed away while captains, majors and colonels walked in and took over while the managers sat in the hall outside. Would these new bosses have deducted that hateful 50c.? And if so, what then?

What if "No Feex"?

It's not pleasant to think of. But something like that has to be thought of now. "President Roosevelt," said a grimy-faced miner to me, "he tell us he feex, he take care of us if all go back work. Eef he feex, okay. But eef he no feex, den by God, we all make beeg strike, all togedder!"

Of course, neither the President nor his spokesmen on the Labor Board made any such promise. But all the same, if the final result is "No feex," the present close tie-up between labor and politics is likely to get its severest jolt. That decision between fix and no-fix is sure to be difficult because it will require choice—political choice—between Presidential-Enemy Lewis and Presidential-Friend Murray. Very much that same choice is now awaited by the whole of industry and of economic America. "The Little Steel formula assumed that Government would stop prices in their tracks. As long as it fails to do so, then the formula means nothing!"

So another wildcat is turned loose, the wildcat of inflation!

Meanwhile, more than a few well-informed persons are sure that this anthracite wildcat would not have appeared at all except for politics.

"When we and the Government agreed to get the needed additional output by sixth-day operation, we applied to 'Assistant President' Byrnes for the required price increase. A little later he referred our request to OPA. After considerable delay, OPA told us that its decision would in the course of time be given us by OWI. It was political considerations, undoubtedly, that made OWI delay its announcement until it could accompany it by announcing the same day the Department of Justice's indict-

CURTAIN FALLS ON RUMP MOVEMENT

Andrew Yevchak, president, "Tri-District General Mine Committee," makes his farewell address Jan. 17 before his rank-and-file group votes to dissolve after vainly attempting for months to secure a charter from the United Mine Workers. Reflecting dissatisfaction among miners in District 7 and elsewhere, this group was an outgrowth of attempts to secure greater power for the anthracite members of the United Mine Workers. It was the leader in the movement for reopening the contract for a \$2 wage increase, and backed up its views with a threat of a general strike on Jan. 15.



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ment of various anthracite operating companies and their officers. If we could have put the sixth-day into operation right after agreement had been reached, it would have meant an immediate raise in the miner's weekly intake and probably have saved the whole difficulty."

Small wonder that a Wyoming miner told me: "My old dad tells me he once heard John Mitchell say in Philadelphia that 'When our miners' union cares for nothing but money, always more money, and when it starts dabbling in national politics, then its usefulness is in grave danger.'"

Whether or not the next few months prove Mitchell right, it looks as if the Valley's cat had made more than a minor scratch on the tender hide of politics. Finally, there's the sacred cow of those who have proclaimed unionism, local unionism, district unionism and now nation-wide unionism, as the simple, easy panacea for all labor troubles.

What those insurgent miners in District 1 were pounding home was that a union is as good or as bad as its agreement is dependable or undependable. If its contract means little or

nothing, then the union means little or nothing. That contract, in turn, is only as dependable as the will and power of its signers to enforce it. Those insurgents believed they were striking for democracy. Nevertheless, they were, in reality, raising a very serious question: Can a thoroughly democratic union be a strong union—strong enough to make its signature and its agreement worth the paper it's written on?

John Lewis, pretty surely, would answer with his "No, not until such workers as mine have had the benefit of many years of hard experience!"

Where Is Utopia?

And he'd not be so very far from right. That, in turn, raises many questions, too many to be discussed here but not too many for the country to ponder before it insists that Utopia lies just on the other side of nation-wide closed-shop unions and agreements. At any rate, the coal operators, in bituminous as well as anthracite, are today wondering and, yes, worrying, just how deep the Wyoming wildcat has dug into the validity of their industry's agreements.

How seriously should they take the

possibility that the hard-coal miners will demand and obtain a self-governing department? Or split off into an independent, perhaps hostile, group? If so, under whose direction? Or the likelihood that John Lewis will end his absenteeism by taking time to re-establish his contacts and his leadership in the anthracite field?

What are the chances that the approaching demand for a \$2 coal increase will get mixed up first with the now threatened flood of wage demands from steel, autos, textiles, etc., and then the whole wad be tangled up with Washington's mess of pro-Phil and anti-John, pro-labor and anti-farm, politics?

And if this were to weaken the leadership of John Lewis, what then?

Me, I don't know the answers. But I do know that some thousands of operators join some hundreds of thousands of miners in finding it virtually impossible to name any person throughout the length and breadth of America who is as well equipped as John to make his signature mean something like stability to their industry.

How deep did the anthracite wildcat scratch? I don't know, but deep!

COAL DELIVERS

In a Year Marked by Rationing of Oil

Bituminous Production Sets Record—Anthracite Also Up—All Gas Use Restricted in 1942—Oil Rationing Started in 30 States in September—Steps Taken to Increase Work Week in Coal Mining

"COAL delivered the goods" sums up the 1942 accomplishments of the industry. In carrying out their task despite growing shortages of men and materials, plus other war-time difficulties, operators and miners had yeoman assistance from the railroads, manufacturers and suppliers of equipment, government agencies and officials, and consumers in all categories. The end result was a tentative new high for bituminous coal and a further substantial gain for anthracite in its comeback efforts.

Bituminous production, on the basis of preliminary estimates by the Bituminous Coal Division, totaled 580,000,000 tons in 1942. If this estimate is borne out, the 1942 output is the largest so far in the history of the industry. Next highest was 1918, with 579,385,820 tons. The 1942 preliminary total was an increase of 65,851,000 tons (12.9 percent) over the 1941 figure of 514,149,245 tons. This increase was accomplished largely by raising production at mines already in existence, as the number of new operations brought into production or under construction was relatively small (see p. 84).

Anthracite enjoyed its best year since 1930 with an output of 59,961,000 tons (preliminary estimate, Bureau of Mines). This was an increase of 3,593,000 tons, or 6.4 percent, over the 56,368,267 tons in 1941. Commercial production in 1942, eliminating colliery fuel, etc., was approximately 57,000,000 tons, compared with some 54,000,000 tons in 1941.

Anthracite continued to operate under the Production Control Plan administered by the Pennsylvania Secretary of Commerce. Continued absorption of "bootleg" miners by legitimate producers and strengthened law enforcement in both Pennsylvania and neighboring states sharply reduced stolen-coal production. Trucking of anthracite continued at high levels in

In Appreciation

In preparing this Review and War-Progress Number of Coal Age, the editors have had the assistance of many operating men, association and government officials, coal-research men and manufacturers. This assistance has been a vital factor in insuring the completeness of the review of trends and developments. To all who have contributed, therefore, our sincere thanks.

1942. An increase of 5c. per ton was imposed on rail movement of coal in March, with 10c. to certain western and southern destinations. Like bituminous, anthracite also was subject to the 4c. per ton federal excise tax enacted Oct. 1.

The so-called "motor-compelled" rates in force for several years and scheduled to expire Nov. 11 were extended to June 20, 1943, while the Pennsylvania Attorney General, in cooperation with anthracite producers, continued attempts to secure reductions in rates on steam sizes in the existing "motor-compelled" zone, furtherance of the influence of these rates in eastern and central New York and other areas, and readjustment of existing tariffs on steam sizes in specified sections of the latter area. On Nov. 7, an I.C.C. examiner recommended a 46c. per ton cut in rates in the "New York Tidewater Case."

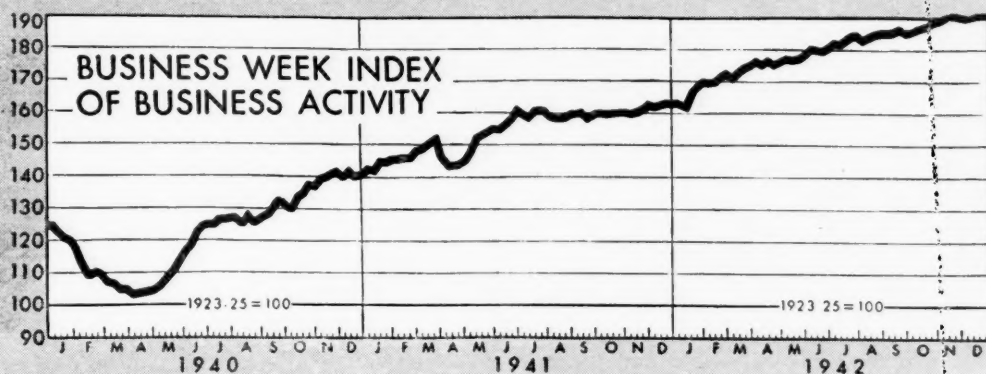
Continued stress on research work also marked anthracite developments in 1942. Work continued on the cooperative program financed equally by Pennsylvania and the producers and expiring May 31, 1943. On Dec. 18, President Roosevelt signed S. 357 authorizing "erection and equipment of a building" to conduct research for the anthracite industry when moneys

are available in the U. S. Treasury. Previously (No. 10), Anthracite Industries, Inc., announced that operating companies representing more than 80 percent of the output had agreed to support a considerably enlarged program (December, 1942, Coal Age, p. 58).

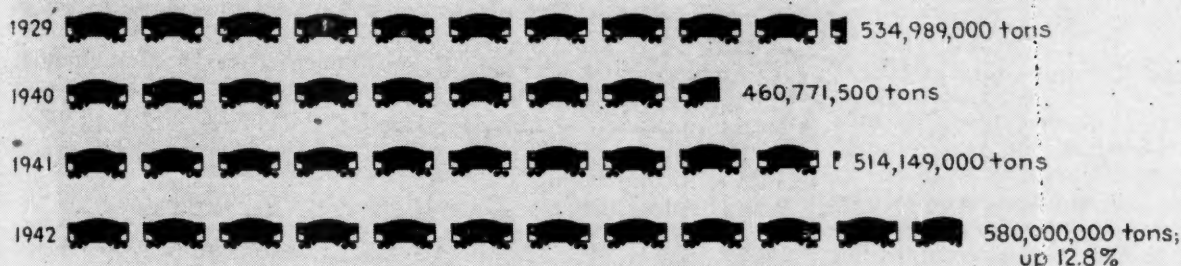
While shipments to New England and Canada showed substantial increases in 1942, a major factor in the added anthracite business in 1942 was the pressure for conversion to offset the fuel-oil shortage, particularly in the East. Anthracite producers and organizations were especially active in means of promoting conversion, as set forth in more detail later in this review. Increased utility, railroad and general demand for steam sizes was another factor.

Bituminous coal also figured materially in the conversion picture in the East and elsewhere, especially from the standpoint of industrial applications. Retail deliveries apparently were higher by some 6,160,000 tons, or 6.3 percent, in part due to conversion. The war effort, however, probably was the major factor in bituminous advances in 1942. Production of pig iron alone required some 4,000,000 tons more coal, a rise of 5.6 percent. Railroad consumption was up some 13,869,000 tons, or 18.2 percent, paralleled by a 28.4-percent rise in liquid-fuel consumption. Utilities burned over 3,000,000 tons more coal, an increase of 4.7 percent, while natural-gas consumption rose 15 percent and oil use dropped about 25 percent. General industrial consumption of bituminous coal other than the above was up some 13,000,000 tons, or 8.1 percent.

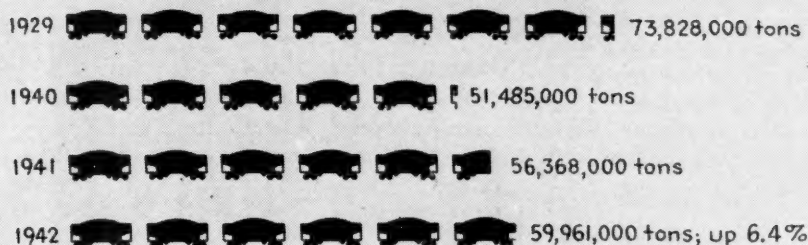
Continuation and acceleration of these demands is expected to require the production of 600,000,000 tons of bituminous coal and 65,000,000 tons of anthracite in 1943, according to Solid Fuels Coordinator for War Ickes. Achievement of these goals brings in.



War hikes business activity in 1942.



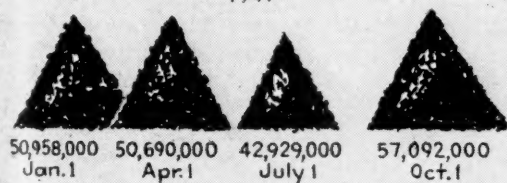
Bituminous output hits new high in 1941.



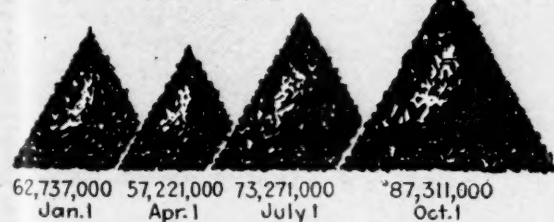
U.S. Bureau of Mines

Anthracite production up 6.4 percent.

Bituminous Coal Div.; N.A.P.A.
1941

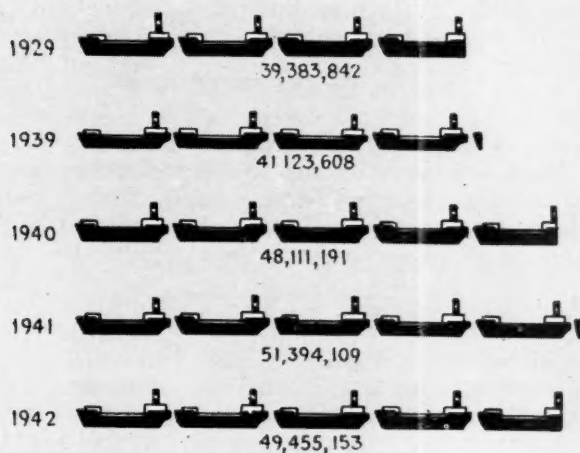


1942



Bituminous stocks increase in 1942.

Ore and Coal Exchange



Lake shipments.

among other things the problems of materials and equipment, manpower and transportation. A simultaneous study of bituminous-producing capacity indicated, it was stated, an annual total of approximately 570,000,000 tons. Likewise, anthracite has relatively little producing margin and this condition was responsible, with other factors, for pressure toward the end of the year for extension of the work week.

While, as might be expected, materials and equipment got tighter as the year wore on, supplies sufficient to enable the industry to operate were provided by the War Production Board through higher priorities and other means (see p. 79).

Good Transportation in 1942

Railroad transportation remained good throughout the year, although at the end reports of actual or impending car shortages became more numerous. However, no acute or prolonged shortage was expected, barring an unforeseen change in conditions. There was some readjustment of normal railroad movement, and also water movement, due to war-time conditions, accompanied by establishment of new rates for certain overland hauls to replace coastwise traffic, measures to stimulate movement over inland waterways and adoption of the principle of absorbing extra costs due to unusual or emergency coal movement, especially into New England, by the government.

Manpower remained as one of the industry's most pressing problems at the end of the year.

By July 1, according to figures compiled from a survey of mining companies, the bituminous industry had suffered a net loss of over 40,000 men. Definite figures for the entire year were not available at the time this issue went to press, but it seems that the net loss certainly was not less than the above. Anthracite seemed not to have suffered quite so much as bituminous, but available evidence indicated a net loss of perhaps 5,000 men or more by the end of the year, with the total rapidly growing.

Looking forward to the greater strain on producing facilities, pressure to promote stocking of coal was exerted early in the year by producers and government officials, including Coordinator Ickes, who urged consumers to start protecting themselves from the standpoint of coal reserves Jan. 8 in accordance with a Presidential request.

To facilitate storage, the War Production Board Feb. 13 specifically revoked the application of inventory

restrictions imposed under Priorities Regulation No. 1 in so far as they might apply to coal and coke. On Feb. 15, excepting an abortive attempt to curtail gasoline consumption in the fall of 1941, natural gas earned the distinction of being the first fuel to be rationed. WPB on that date restricted the use of natural and mixed gas in 17 states and the District of Columbia (Order L-31).

The first major action in the price field in 1942 also came up in February, when the Bituminous Coal Division announced that steps were being taken to ascertain changes in bituminous costs and prices as a preliminary to appropriate adjustments in minimums.

March 14 witnessed the completion of a working arrangement between the Bituminous Coal Division and OPA for the prevention of inflated prices. On this date, also, WPB released an order restricting the use of oil in 17 eastern states and the District of Columbia (L-56). The order also provided for relatively gentle pressure for conversion. Higher freight rates on coal (3c. per ton where the rate was under \$1 and 5c. for higher rates) went into effect March 18 despite an attempt by OPA to have them postponed.

Maximum Prices Fixed

April 1 ushered in the first comprehensive maximum-price order dealing with solid fuels, although earlier (Jan. 28) a ceiling had been placed on Pennsylvania oven coke. The April 1 order (MPR-112) established maximums for anthracite delivered from the mine or preparation plant.

May brought an appeal from Donald M. Nelson, WPB chairman, for more stocking of coal, while the RFC made arrangements to provide funds to cover the excess cost of transporting coal to New England by rail or rail-and-water routes not normally employed. The ICC also approved new arrangements to speed movement of southern Appalachian coal to New York piers for forwarding by barge to New England.

Price ceilings for all remaining solid fuels was another May development. MPR-120 (bituminous coal delivered from mine or preparation plant), MPR-121 (miscellaneous solid fuels delivered from producing facilities) and MPR-122 (wholesale and retail distribution of solid fuels, as distinguished from delivery by producers) all went into effect May 18.

May also witnessed a further cut to 50 percent in deliveries of light fuel oil in the East under Order L-56. To speed conversion, the terms of

WPB Order L-79 (freezing all plumbing and heating equipment effective April 16) were relaxed to permit increased sale of cooking and heating stoves and water heaters, as well the sale of equipment needed to convert from oil in homes without a priority certificate.

On May 6, Selective Service Director Hershey ruled that workers in critical occupations in the coal and railroad industries could be deferred from military service on occupational grounds.

Equipment Orders Modified

Late May and June brought out modifications of Orders L-74 and L-75, cutting off manufacture of oil burners and coal stokers. L-74 was amended to permit the production of "Class A" oil burners to fill orders bearing ratings of A-10 or higher. L-75 was amended to permit the assembly of stokers under 61 lb. per hour from material on hand to facilitate conversion, while L-79 was amended to permit dealers to sell such machines as they had or could acquire.

June 13 was a red-letter day for Secretary Ickes, who had previously been rebuffed several times in efforts to get clearance for materials for an oil line from Texas. That day, he announced that orders had been placed for 24-in. pipe for a line from Texas to Illinois with a capacity of 300,000 bbl. daily. Meanwhile, efforts to stimulate rail movement by reassigning tank cars had been successful in building deliveries by this method to the East to over 700,000 bbl. daily.

Increased activity in the construction of new and relocation of old pipelines, as well as adjustments in the operation of others, to boost movement to the East began to gather momentum in June and continued active thereafter. At the same time, the government widened its program for absorbing the extra cost of coal movement over emergency routes, both all rail and rail and water.

The subject of allocation of coal (a tentative plan had reportedly been prepared by certain government agencies) popped up in July, but no action was taken. Proposals for freight-movement zoning got scant consideration.

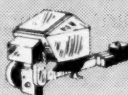
With manpower considerations growing more critical, July was marked by a wide increase in measures by miners' representatives, the government and operators to reduce absenteeism and increase production.

A net loss of 43,000 bituminous miners between Jan. 1 and July 1 was announced Aug. 21 by J. D. Battle, executive secretary, National Coal Association, while pressure for reduc-

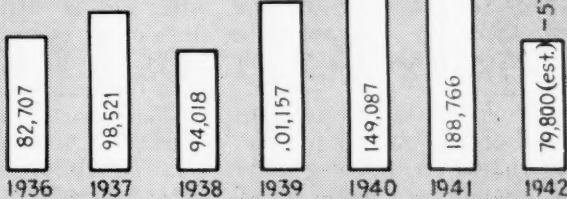
COAL

1941 92,606,000 tons

1942 109,475,000 tons, +18.2%



Census Bureau



Factory sales on Classes 1, 2 and 3 stokers show a heavy loss in 1942.

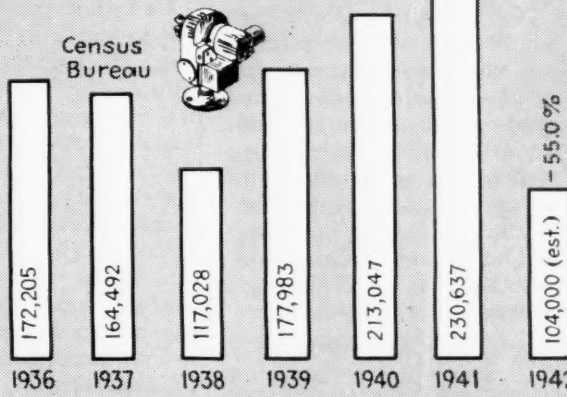
LIQUID FUEL

1941 74,538,000 bbl.

1942* 95,700,000 bbl.; +28.4%

*Partly estimated. I.C.C. data
Four bbl. oil equivalent 1 ton of coal

Oil leads coal in railroad field in 1942.



Oil-burner shipments to U. S. (excluding large boiler- and furnace-burner units) drop 55 percent in 1942.

COAL

1941 64,756,000 tons

1942* 67,800,000 tons; +4.7%

OIL

1941 20,248,000 bbl.

1942* 15,100,000 bbl.; -25.4%

NATURAL GAS

1941 205,155,517,000 cu.ft.

1942* 235,000,000,000 cu.ft.; +15.0%

*Partly estimated. F.P.C. data. One ton coal equivalent to 25,000 cu.ft. gas

Oil behind, gas ahead in utility field.

1941 71,000,000 tons (est.)

1942 75,000,000 tons (est.); +5.6%

Coke used in making pig iron rises 5.6 percent.

1941 162,153,000 tons

1942 175,277,000 tons (partly estimated); +8.1%

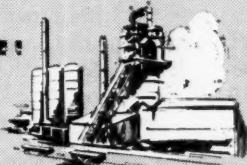
U.S.B.M.; Bituminous Coal Div.; N.A.P.A. Includes that part of coal changed to coke ovens not represented by coke use in pig-iron production

Coal for general use (steel and rolling mills, coal-gas retorts, cement mills, "other industrials") shows an 8.1 percent gain in 1942.

1941 97,460,000 tons

1942 103,620,000 tons (partly estimated); +6.3%

Retail deliveries of bituminous coal show a further gain in 1942.



ing absenteeism and promoting production continued. In that month, also, an operator-miner committee was set up to confer with War Manpower and Selective Service officials in an attempt to stop the manpower drain. Suggestions that anthracite go on a six-day week, already permitted for twelve weeks in the year under the regular agreement, also marked July developments.

Stoppage of fuel-oil deliveries for heating and cooling Aug. 3 to Sept. 16 in preparation for rationing in 17 eastern states and the District of Columbia was a major August move. Early in that same month, construction of the Texas-Illinois pipeline got under way. Additional supplies of iron and steel were made available for greater manufacture, and the process of obtaining conversion materials was further eased. Additional tank cars were diverted for the eastern run and steps were taken to increase barge pipeline movement of oil eastward. Further attention was focussed on building up the coal supply in Washington and Oregon and in Kansas and Missouri, in addition to New England. New rail and rail-and-water tariffs were adopted to speed coal shipments to the latter region.

Manufactured-gas deliveries were restricted in Order L-74 effective Sept. 1. In November, both this and the previous L-31 order (natural and mixed gas) were extended to the entire country and tightened up. Sales of natural gas in 1942, according to preliminary estimates by the American Gas Association, increased 10.4 percent. Sales of the manufactured product were up 8.6 percent.

Oil Rationed

Thirty states were covered in the oil rationing plan announced Sept. 15 and effective Sept. 30. The plan was based on maintenance of a 65-deg. day-time temperature and was stated to provide a one-third cut in oil consumption in the rationed area.

Initiation of negotiations for lengthening the work week in coal mining marked September developments. Taking the lead, Coordinator Ickes called representatives of the operators and miners to Washington Sept. 28 and told them that the increasing demands for coal necessitated an increase in working time.

Sept. 30 marked the end of manufacture and assembly of small stokers (under 61 lb. per hour). Sales of commercial and industrial stokers were left subject to priorities, but steps were taken to make it easier to secure and install industrial units. The operation of Order L-75 and its parallel order

for oil burners, L-74, resulted in sharp cuts in the installation of both.

The first general revision in minimum bituminous coal prices went into effect Oct. 1, representing increases of 5 to 30c. per ton. Rising costs, however, resulted in agitation for still further adjustments and preliminary steps to that end were taken in January of this year (see news section this issue).

The principle of the longer work week with time-and-one-half or rate-and-one-half over 35 hours was approved by the United Mine Workers' annual convention in October, clearing the ground for negotiations.

Discuss Longer Week

Following miner approval of the longer week, initial conferences between the union and Appalachian operators (the southern group abstaining) started in New York Oct. 27; anthracite, Oct. 28. Previously, Oct. 21, the President signed the new federal revenue act providing, among other things, an excise tax of 4c. per ton on coal-freight shipments. New western routes were opened to speed movement of coal from West Virginia and eastern Kentucky to New England destinations.

Conferences between northern Appalachian operators and the union over adoption of the longer work week continued until Nov. 17 and then were adjourned without agreement because of lack of definite information as to whether price adjustments would be granted by OPA to take care of the added cost. There also was a disagreement as to terms. Following adjournment, John L. Lewis authorized the signing of local agreements so long as they conformed with a standard text.

Earlier in the month (Nov. 2) the union, which already had agreed to a six-day week in these regions, authorized Sunday work in the Rocky Mountain and Pacific Coast fields.

Anthracite operators and the union agreed in principle on a six-day week Nov. 5, but held off putting a supplementary agreement into effect pending granting of higher maximum prices by OPA. This increase came through Jan. 6, 1943, to go into effect Jan. 9.

Delivery of pipe for extension of the Texas-Illinois pipeline to Pennsylvania with branches to Philadelphia and New York was another November development. At the same time, Coordinator Ickes began missionary work for a 20-in. "products" line paralleling the present 24-in. crude line. November also brought a further cut in oil and gasoline rations for the 17 eastern states in the most

critical zone, designed to save an additional 11 percent. Meanwhile, government officials expressed great dissatisfaction with the progress of conversion, especially home equipment, and made preparations to crack down more sharply.

December ushered in an oil crisis in the East, which culminated in January of this year (see news section) in a ban on all pleasure driving, further cuts in the use of oil for public buildings and agitation for the establishment of a priorities system for oil deliveries.

While additional plans were made to speed oil movement, including the construction of 1,000 tugs, towboats and barges, OPA issued a rationing order (No. 9) designed to promote the installation of coal- and wood-heating stoves to replace oil. To facilitate industrial and commercial conversion, granting of priority applications was streamlined by WPB in December, and the organization also moved to make available 300,000 additional stoves and arranged with the Army to release 100,000 more units.

Coal Supply Tight

The coal supply also began to get tighter in December, especially in the anthracite-burning territory of the East, and as a result of the strike in January of this year an embargo was placed on shipments to Canada and points west of Erie, Pa. Bituminous coal also was in short supply in some regions in December in spite of the stocking program which carried the total in storage up to 90,608,000 tons on Dec. 1. As a result of developments later in the month and early in January, 1943, large consumers with heavy stocks on hand were being asked to reduce receipts under contracts to make coal more readily available to other users.

In the field of manpower, December brought forth an amended Selective Service bulletin (No. 4) listing 53 occupations in coal mining and preparation requiring six months or more of training as essential. On Dec. 10, the anthracite industry and the United Mine Workers agreed on contract modification for a longer work week, but bituminous negotiations resulted in a split over terms which had not been resolved at the end of the year. An idea that the War Labor Board take jurisdiction was rejected by that body. Despite pressure by government officials, no agreement was secured by the end of the year, and early in 1943 individual companies and districts in the northern field were taking the bull by the horns and signing up (see news section of this issue).

COAL-ACT EXTENSION

Favored by Most Bituminous Operators

Benefits of the Act Held Good Reason for Extension — Modifications Recommended, However — Chief Change Suggested Is Speeding Up the Process of Adjusting Minimum Prices to Changes in Costs

SENTIMENT in the bituminous industry seems to favor extension of the Bituminous Coal Act of 1937 with modifications to remove certain objections, clarify some provisions and, especially, speed up the process of readjusting minimum-price schedules following a change in costs. This is the gist of private and public expressions of opinion in recent months, as well as the views of district board chairmen covered in a recent telegraphic survey by Coal Age.

The act, extended two years from its original expiration date of April 26, 1941, again is scheduled to expire April 26 this year. Reextension and modification has been under active consideration in the last few months. The first official step was taken at the behest of the United Mine Workers of America when a bill sponsored by this organization was introduced in the House Nov. 16, 1942, by Representative Jenkins and in the Senate by Senator Guffey. In line with the union's contention that it should have a voice in the administration of the act, this measure proposed a commission of three men, one a representative of the public, one the operators and the third the union. No action was taken on this proposal before adjournment of the 77th Congress.

An Interior Department resolution for extension of the act with revisions was under consideration by the Department in consultation with operators and others in the latter part of the year, and late word was that preparations were under way to offer it soon in this session of Congress. This resolution, among other things, does not contemplate reversion of administration to a commission.

In the Coal Age survey, the following telegram was directed to the chairmen of the Bituminous Coal

Producers' Boards for the various districts:

"Your ideas whether Bituminous Coal Act should be extended and how it should be modified desired for Coal Age publication."

Of those chairmen heard from (a few replied that the boards had not yet taken a stand or were working on the question), all were unanimous in reporting sentiment in favor of the extension of the act, in most cases with modifications. Greater speed in the adjustment of prices, as stated previously, was desired by most. Other suggestions by the various chairmen are included in the texts of their replies, as follows:

CHARLES O'NEILL

Chairman, District No. 1 Board

Of course the Bituminous Coal Act should be extended. The progress and improvement made by the industry under the act furnish the reason for its extension. It should be modified so that prices could be changed more readily when costs obviously increase, such as at a time of wage increase. It is conceded that it is still experimental and a limitation on its extension should be for two years after cessation of hostilities.

D. T. BUCKLEY

Chairman, District No. 3 Board

Believe act should be extended with limited amendments for period covering two years after cessation of hostilities. Any amendments should be limited in scope and one very definitely should cover the granting of authority to the Bituminous Coal Division to adjust prices temporarily pending a full hearing after any advance in wages, as we understand

sufficient authority is not contained in the present law to permit this being done. Our board has gone on record unanimously in favor of the extension of the Bituminous Coal Act and believes that results achieved to date have been satisfactory.

THOMAS COURTNEY

Chairman, District No. 6 Board

Bituminous Coal Producers' Board for District No. 6 will support the proposed extension of the act and amendments thereto, as suggested by the Bituminous Coal Division, Department of the Interior, together with such amendments as are subsequently proposed if they are to the best interests of the producers in District No. 6 and the consumers thereof.

J. R. HENDERSON

Chairman, District No. 10 Board

District board and its officers have not taken position regarding extension of the Coal Act, believing this is a matter to be expressed by each individual code member. However, the vast majority of the code members in Illinois favor the extension of the act for at least a period of two years after the end of the war.

K. G. CARNEY

Chairman, District No. 12 Board

Survey indicates most Iowa producers in numbers and tonnage favor extension of the Coal Act. Recommendations: that act provide a method to expedite cost and price hearings; examiners to have full authority to render decisions; collection of taxes and assessments under act to be more stringent; minimum and maximum prices should be a function of Coal Division; further recommendation that Division provide a department of information where authorized interpreta-

tions of rules may be dispatched promptly.

GEORGE REEVES

Chairman, District No. 14 Board

It is my opinion that Coal Act should be extended and for a longer period than last extension, which was considered a trial period. Unless act is extended I believe industry will return to the same chaotic conditions which existed following the last war up until the time minimum prices were enacted under the present act.

T. E. JENKINS

Chairman, District No. 16 Board

Following telegram under date Nov. 8 to Bituminous Coal Division giving my own and District 16 views on renewal of Bituminous Coal Act: "For extension of the act with elimination of Consumers' Counsel; his functions adequately performed by OPA. The words 'classification of coal' be eliminated. Sec. 4 II (a) be amended giving Division power to determine on own motion when 2c. change occurs in weighted average costs. Term 'dumping' to be defined. Sec. 4 II (i) 8 amended to prohibit false or misleading representations as to heat value. Sec. 7 amended to conform with present revenue law. Provision inserted in act similar to Interstate Commerce

Act making purchaser subject to penalty for accepting or soliciting violations. Suggest new act should contain no time limit upon the act. New act should provide that changes in costs be reflected more promptly in minimum prices than heretofore."

T. J. O'BRIEN

Chairman, District No. 19 Board

Believe Bituminous Coal Act should be extended. Believe that many paragraphs of the act could be more clearly written and arranged so that it could be more easily interpreted and the paragraphs of the new act renumbered to make it intelligible. The act, in my judgment, would be much improved if it could be simplified to make it more easily administered. More authority in many matters could be delegated to the district boards, the acts of the boards in all cases being subject to approval of individual or body charged with administration of the act.

Present practice of attempting to issue blanket orders governing prices and the acts of code members throughout the country, in my judgment, is not practicable due to fact that coals and competitive conditions differ widely in different sections of the country and an order may be practi-

cable in one section and wholly unworkable in another. For instance, competitive and marketing conditions in sparsely settled districts of the West are quite different from what they are in highly developed industrial sections of the eastern states contiguous to area where the great preponderance of bituminous coal tonnage is produced. Many provisions under NRA preferred over a number of provisions under the present Bituminous Coal Act.

L. R. WEBER

Chairman, District No. 20 Board

In my opinion, Bituminous Coal Act should be continued under direction of Bituminous Coal Division, modified so as to exclude the inclusion of captive coal costs from any consideration in determination of price schedules for commercial coal.

CHARLES F. LARRABEE

Chairman, District No. 23 Board

District 23 feels Coal Act should be extended but modified to provide much greater flexibility so that changes in minimum prices would be made quickly after changes in costs and not many months later as at present. Reports required of producers should be reduced to absolute minimum and made simple as possible.

ANTHRACITE

Refines and Improves Methods in 1942

Conveyor Installations Show Substantial Increase—Tunnel Work and Stripping Active—New Methods of Pumping and Fighting Fires Developed—Improving the Fine Sizes a Major Goal in Preparation Work

A YEAR of large and profitable production and consequent assurance in the anthracite region has not resulted in any extensive revision of methods or any large developments because the shortage of men and the denial of materials has made expansion difficult. Most of the improvements seem to come under the classification of refinement of methods and discovery of substitutes.

Shuttle cars went into satisfactory service at one colliery, though the seam terrain did not prove as favorable as had been expected from boreholes, for some gradients exceeded 9 percent. However, it is hoped that

a more favorable location will be available in an area already penetrated by a gangway, but in the anthracite region only by development can the nature of seam terrain be definitely determined. Conway loaders have been purchased by the Edison Anthracite Co. for Nesquehoning, the Lehigh Valley Coal Co. at Hazleton, the Hazle Brook Coal Co. at the Continental mine, and the Jeddo-Highland Coal Co. at Drifton. These loaders will clean rock for a width of 12 ft. and work in a 6½-ft. vertical clearance. It is to be hoped they will speed development so as to enable present tonnage to be maintained.

In 1941, the most recent year of which statistical information is available, conveyors in actual use showed progress. There were 2,189 hand- and self-loading conveyors, including pit-car loaders, in use in 1940. In 1941 the total had increased to 2,432, a gain of 11.1 percent. Anthracite mines had 547 scrapers and mobile loaders (relatively few of the latter) in use in 1940 and in 1941 the number had fallen to 505, a decline of 7.7 percent. Though scrapers were first used in the anthracite region, the trend to conveyors is quite obvious.

The extent of scraping and conveying in the industry can be judged



Stripping, along with mechanical mining, registered gains in the anthracite region in 1942.

by comparing the number of scrapers in the anthracite region with those in the whole coal industry. Despite its small production, anthracite used 40.3 percent of the conveyors and 82.2 percent of the scrapers. As stated, however, the scraper totals in the anthracite region include the few mobile loading machines and in the bituminous regions they do not. The Pennsylvania Coal Co. has purchased many conveyors for use in chambers.

Last year, the Philadelphia & Reading Coal & Iron Co. took initial steps in the development of the Newkirk tunnel, located on the lands of that company at Tamaqua. Present plans call for driving this water-level tunnel 2,180 ft. to the Buck Mountain bed, with coal gangways driven in the Orchard, Holmes and Buck Mountain beds and rock gangways under the Mammoth bed.

To promote the speedier construction of the tunnel and facilitate the rock work, a mechanical shovel has been installed, also a transformer station, motor-generator set, two electric air compressors, an electric fan and rock-disposal facilities. Several buildings have been erected.

During the coming year a plant for rough-cleaning the coal prior to shipment to the St. Nicholas central breaker will be erected. This operation will furnish, it is expected, employment for 300 men and will be the initial step in the development of the Tamaqua lands, which are one of the main future resources of the company.

Initial steps also were taken in the development of the Bast property by reopening Hunter's Tunnel, located

on the South Mountain of the Mahanoy Valley, midway between Girardville and Ashland. During the year, activities were confined to reopening the tunnel a distance of 890 ft. and driving gangways for a short distance on the Primrose and Orchard beds. Eventually, gangways will be driven in the Holmes, Primrose, Mammoth and Buck Mountain beds.

For 1943, it is planned to install substation equipment, a motor-generator set, electric locomotive, electric air compressor, a ventilating fan and other equipment necessary for the development of the property. Here also will be erected a plant to rough-clean the coal prior to shipment to the St. Nicholas central breaker. This operation will eventually employ 150 men.

In March, 1942, Philadelphia & Reading completed its prospecting of the proposed Beechwood Mammoth bed stripping, located about 1½ miles north of Minersville. A large number of churndrill holes were sunk to ascertain levels, coal thicknesses and intervals. This stripping will be about 3,000 ft. long, 800 ft. wide and in some sections will reach a depth of 400 ft. In this pit is proposed to use some of the largest stripping equipment ever operated in the anthracite region.

A stripping was opened also by J. Robert Bazley, Inc., on the property of Lawrence Fuels, Inc. (previously the Schaefer Estate), just outside Shenandoah, where has been put in operation a Bucyrus-Erie electric dragline with a 110-ft. boom and 4-cu.yd. bucket, a Pawling & Harnischfeger electric dragline with an 80-ft.




boom and a 3-cu.yd. bucket, a 43-B Bucyrus diesel dragline with a 70-ft. boom and 2-cu.yd. bucket.

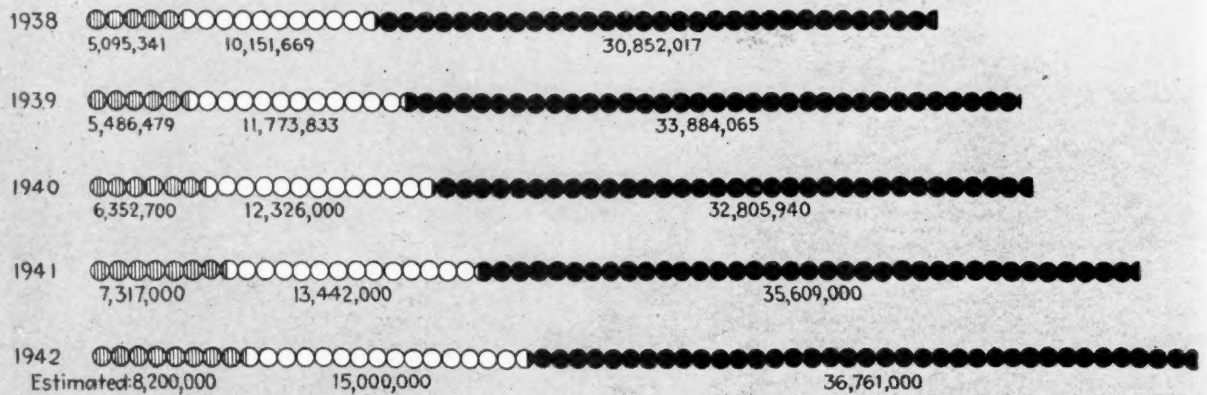
A fleet of Mack trucks hauls the coal to a cleaner plant erected by Bazley alongside the Reading R. R. at the foot of the hill. Heavy rock from the breasts is removed in the cleaner plant and the large blocks of coal are passed through rolls to break them down to a size that will pass through the gates of railroad cars when delivered at Packer No. 5 colliery of the East Bear Ridge Colliery Co.

Installation of a large electric hoist at the Coal Dale colliery was started near the close of the past year. It will be the last of the Lehigh Navigation Coal Co.'s operations to abandon steam for hoisting. At the Edison Anthracite Co.'s Nesquehoning colliery, Carbon County, the hoisting shaft has been extended to a lower level. At the Weston colliery, Locust Coal Co., Shenandoah, a load and voltage survey of the electrical loads was made in June, 1941, and as a result three 500-kva. transformers reducing potential from 66,000 to 11,000 volts were purchased. The installation of these will improve the voltage and load control. Dispatching of the power load irons out many of the peak demands. After a study of transportation, changes were made in the hoisting cycle and turnouts at the bottom and top of the slopes were rearranged.

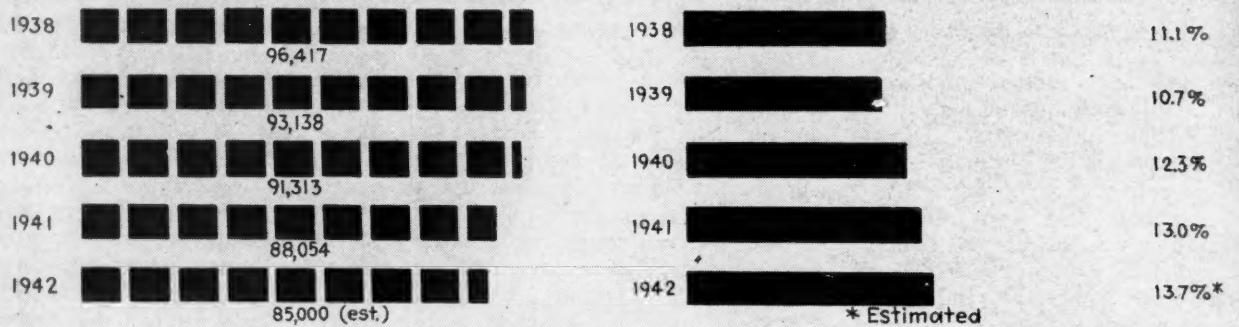
To give the centrifugal pump on the Fourth Level the effectiveness that goes with receipt of water under pressure, as in complete submergence; a small auxiliary pump of the deep-

ANTHRACITE OPERATING STATISTICS

 Strip
  Mechanically loaded
  Produced by other methods

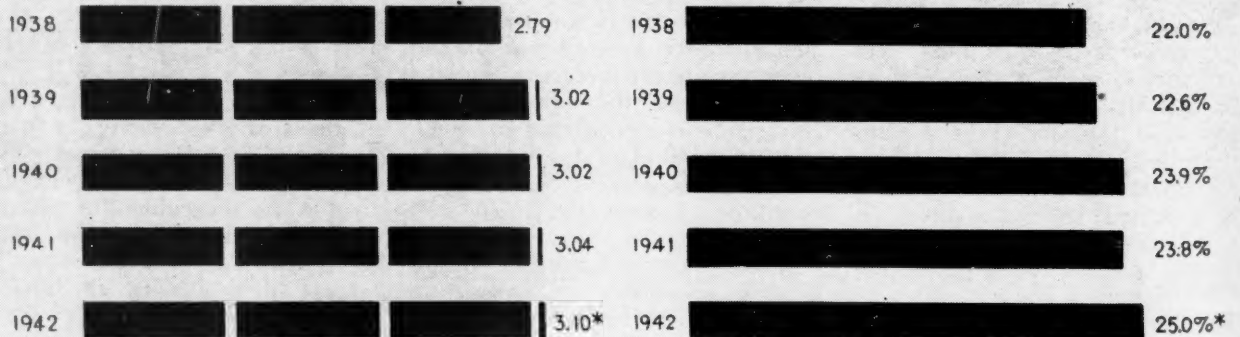


Strip and mechanically loaded tonnage continue upward trend in 1942.



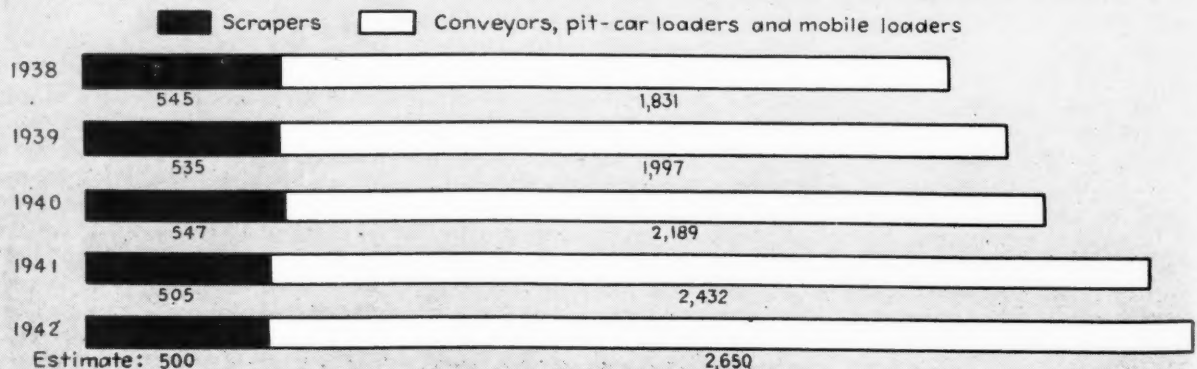
Anthracite employees probably down in 1942.

* Estimated
Strip percentage shows further rise in 1942.



* Estimated
Output per man-shift trends upward.

* Estimated
Mechanically loaded percentage continues gains.



Mechanical-mining equipment in service continues rise in 1942.

well type was provided to deliver water to the larger pump, thus keeping it full at all times and preventing it from drawing air (*Coal Age*, December, 1942, p. 63). But other plans contemplated a reduction in the volume of water to be handled. After the heavy rains of last May, the Locust Coal Co. ditched behind the outcrops for an aggregate distance of a mile. This has materially reduced the quantity of water that enters the mines after a rain. Studies also are being made to find places for the erection of dams at strategic points to control drainage during high water and to control it so that it can be handled at off-peak periods. To increase the utility of new or emergency pumping units, speed increasers have been used by the Lehigh Navigation Coal Co. to adapt old and slow-speed motors to high-speed pumps. The Pennsylvania Coal Co. has installed deep-well pumps to eliminate long discharge pipes and unnecessary supervision, as well as several ventilating fans to replace antiquated types. The new fans, because of their efficiency, save 50 percent of the power used by their predecessors.

In fighting a mine fire, the Alden Coal Co., Luzerne County, used dry ice. To all appearance the fire had been smothered before the ice was placed behind the seals, but the dry ice served to aid further in that smothering and to cool the coal to such a temperature that the fire could not revive. After a fire is "out" it always may be expected to revive if good air is admitted before the coal has been reduced to a safe temperature. (*Coal Age*, September, p. 81).

What's New in Preparation

Preparation still remains one of anthracite's principal concerns. A big all-Chance breaker was erected at Hazleton colliery, Luzerne County, by the Lehigh Valley Coal Co. with a capacity of 740 gross tons per hour (410 tons of clean coal). This and the East Bear Ridge Colliery Co.'s Packer No. 5 breaker equipment (540 gross tons per hour or 315 tons clean coal) are omitted in the accompanying tabulation of the cleaning equipment contracted during 1942, having already been included in the previous year's record. However, the installation actually was made in 1942. Both breakers embodied some unusual features. In the 1942 tabulation, the Giombetti Coal Co.'s equipment that is to do service at the Racket Brook breaker, Carbondale, including two 7-ft. 9-in. cones cleaning 175 tons per hour from egg to buckwheat inclusive and making about 100 tons per hour of clean

coal, is a similar case, for the breaker was under construction in 1942 but was not completed at the close of the year.

Other installations of Chance equipment (see accompanying table for capacities of these and other projects) were a 13½-ft. cone for egg to buckwheat inclusive for the Gilberton Coal Co.; a 15-ft. cone for the same range of sizes for the Stevens Coal Co., at Trevorton; and one 12-ft. cone to clean the same range for the Ontario breaker at Peckville. Rhoads Contracting Co. (Park No. 1 colliery, Ashland) installed a 15-ft. Chance cone for stove, nut and pea, and a 5-ft. Hydrotator for smaller sizes.

Cones Clean All Sizes

Menzies cone separators were installed at several collieries. The Glen Alden Coal Co. put in one at Woodward colliery (Edwardsville), a 7-ft. unit for cleaning egg and stove refuse, plus another 7-ft. cone for nut refuse. The Green Top Coal Co., Jessup, put a 4-ft. unit in operation for cleaning pea and a 3-ft. unit for beneficiating buckwheat. At Tremont, an 8-ft. cone for egg and stove; a 4-ft. cone for nut, pea and buckwheat refuse and a 4-ft. cone for No. 5 buckwheat were installed by the Indian Head Coal Co. This No. 5 buckwheat cone separator is a new Menzies development. It cleans sizes between ¼-in. and 28-mesh. The Moffat Coal Co., Taylor, near Scranton, installed a 7-ft. Menzies cone for egg, stove and nut refuse.

These are all installations for domestic sizes or for more or less complete cleaning jobs, but interest has largely centered in fine sizes. Thus the Colitz Coal Co., Pottsville, introduced a No. 7 "SuperDuty Diagonal-Deck" Deister Concentrator table to clean barley; the Necho Coal Co., two such units for barley, one for flat-nut coal, one for rice, and one for buckwheat; the John Conlon Coal Co., at Madeira colliery (Hudson, Luzerne County), a similar table for the finest of sizes, No. 5 buckwheat; the Evans Coal Co. (Beaver Meadows, Carbon County), one table of the same type for Nos. 4 and 5 buckwheat and a No. 10 Duplex table for the same sizes of coal.

For fine coal also, the Wilmot Engineering Co. installed a 6-ft. Hydrotator for rice, a 7-ft. unit for barley and an 8-ft. unit for Anthracite, all for the Hudson Coal Co.'s Loree breaker at Plymouth; also a 7-ft. Hydrotator for rice, and a 12-ft. 20 tons-per-hour classifier for No. 5 buckwheat, all for the Jeddo-Highland Coal Co.'s No. 7 colliery at Jeddo. Gilberton Coal Co., Gilberton, received a 5-ft. Hydrotator for cleaning No. 1 buckwheat.

At the Tunnel Ridge Coal Co.'s Silver Brook colliery were installed 7-ft. Hydrotators for rice and barley and a 6-ft. unit for No. 1 buckwheat. Rebuilding of the Trevorton breaker of the Stevens Coal Co., which was destroyed by fire, will include 6-ft. Hydrotators for rice, barley and No. 4 buckwheat, and a 12-ft. classifier for finer coal.

A Menzies 4-ft. cone separator for barley and one of the same size for rice was installed by the Supreme Anthracite Coal Mining Co. at Peckville. In addition to the No. 5 buckwheat cone separator installed at Indian Head colliery were 4-ft. units for the same size for the Harry E. Coal Co., Swoyersville, and the No. 9 Coal Co. operation at Pittston.

Vibrating screens have been introduced by the Lehigh Navigation Coal Co. and the Colitz Coal Co., Pottsville, both having installed one 4x7-ft. Leahy Model C unit, 12 tons per hour, for dewatering No. 5 buckwheat. Not only has the Navigation company been experimenting with such a screen but it has given attention also to other wire-mesh screens which require in their manufacture small quantities of critical material. In general practice, the company has increased considerably the recovery of fine sizes of coal, thus meeting, in part, the growing demand for this fuel for electric-power generation.

Oil-Froth Flotation

Extensive experiments on froth flotation of fine coal (minus 28 mesh) were conducted in a pilot plant for several months. Impetus for this work came from the greatly increased demand for fine coal from a power company which serves many major war industries and depends wholly at its local plant upon the coal supplied by the Navigation company. Material smaller than the regular Anthracite product was successfully treated. As soon as practicable, it is anticipated, a large commercial-size plant will be built at Tamaqua to treat the material which is now discharged into Panther Creek and is a factor contributing to the silting of the Schuylkill River. An important step in the process of centralization of the preparation of coal was effected with the completion of a new headhouse at Tamaqua breaker to handle coal from both Greenwood and Tamaqua mines. The unprepared Greenwood coal formerly transported by the railroad company is now being handled by a new narrow-gauge installation. To this extent, standard rail facilities were relieved.

Vitreous clay lining has been used by the Navigation company in the re-

pair of worn wooden flumes carrying from the breaker waste water containing anthracite fines. These liners consist of 2-ft. 9-in. x 18-in. x 1½-in. tile laid on the bottom and secured sidewise by a wood strip nailed to the bottom of the flume. Stone flumes also are used to carry acid water on the surface away from mine openings. Glass has been used in some of the chutes in the Weston breaker, Locust Coal Co., with very satisfactory results. This substitution was made in an endeavor to reduce the quantity of sheet steel required in operation. During 1943, the Menzies cone separator was developed so as to clean ¼-in. x 28-mesh coal (buckwheat No. 5).

Probably no problem is more perplexing to the anthracite industry than what to do with its fines. It is easy to provide for their disposal along the creeks where land is available, but high water washes away the material so stored. Philadelphia & Reading has been pumping them to the top of the hill and back of dams of refuse in the expectation of an opportunity of selling the material later. Some have suggested forming desilting basins below the anthracite fields where wider valleys give greater facilities for storage. In some well-settled regions, the dust from such deposits constitutes a nuisance. In consequence, the establishment of a market for the material seems the best solution, but again it usually is high in ash, holds much water in the summer and freezes in the winter. For this reason, conversion of this material into power at the mine is the solution *par excellence*, but the anthracite region has practically no other industry but coal mining to utilize such power.

Rock Wool and Aggregate

Successful experiments were conducted by the Lehigh Navigation Coal Co. in the use of breaker refuse of egg size in the manufacture of rock wool, this material furnishing not only the necessary silica content but also the required fuel. The slate is reduced to a specified carbon content by jigs. A large pilot plant designed to make large-scale tests in the burning of mine refuse for the production of lightweight aggregate for concrete was completed late in the year. Operation on an experimental basis will be started by the Navigation company at an early date.

Since the first of August, in an effort to increase production to meet war needs, labor-management committees have been formed at the Locust Coal Co.'s colliery with very satisfactory results. The machine shop at

night also has been converted into a school for training men for work in other shops where war material is being manufactured.

Many ways of making repairs have been devised since the war began. The Locust Coal Co., instead of scraping two centrifugal 1,500-g.p.m., 4-stage, 400-ft.-head pumps, has brazed them with homogeneous acetylene welding, using "Sil-Fos" as the build-up material. The Pennsylvania Coal Co. has been using lead for this kind of brazing and has found it efficient. Metallizing also has been gaining.

Old worn rolled-steel locomotive wheels have been purchased by the Locust Coal Co. and the needed metal for repair has been electric-arc welded on hubs, treads and flanges. They are now being used in mine work. On the steep mine pitches, ½x36x120-in. blue annealed steel plates are used for chutes. These usually were left in the mine after a single use or brought out only as scrap. Today they are salvaged and smoothed by running them through the hand-operated rollers of a machine purchased for that purpose.

Use of automatic tread welders is increasing in the anthracite region for the renewal of the treads of locomotive wheels. Both the Jeddo-Highland Coal Co. and the Moffat Coal Co. had one and the Westinghouse Electric Mfg. Co. at Wilkes-Barre has two.

Difficulty in getting material for the construction of the Loree breaker of the Hudson Coal Co. caused the engineering staff to use pipe instead of girders, welding the pipes together.

It gave good results as pipe is stronger than girders. Rails were used in place of purlins.

For some years, the Philadelphia & Reading has been using face shields of plastic or cellulose in breakers, shops and mines. The type most used on the outside is the Dockson face shield, which has wide vision, is light in weight and is fastened to a head band which can be moved over the forehead when not in use. For inside work the company has been experimenting since June, 1940, with the M.S.A. Skullgard-Faceshield, attached to the underside of a Comfo Cap and now it urges its employees to wear them. A supply is carried at all the company's mines.

Subsidence in residential areas have occurred at West Pittston similar to those at Hyde Park and Shenandoah. It is said that the coal under the area involved is not being mined nor has been since the nearby operations reopened.

Bootlegging has gradually been dying away. Some of the bootleggers now have regular arrangements with the coal companies by which they deliver coal at the company's breakers and are paid for it. In other cases, the men have gone back to the mines, for they make much more money with regular work and are compensated for enforced idle time if any. Some have gone to defense industries. But still some remain active and may continue so, until their hole in the ground becomes demonstrably unsafe or caves in and so makes necessary a new hole with all the expense and suspended reward involved in opening it.

New Anthracite Preparation Facilities in 1942*

Coal Company	Plant Location	Capacity, Tons per Hour	Preparation Equipment
Colitz Coal Co.	Pottsville, Pa.	10 ¹	Deister Concentrator ¹
Evans Coal Co.	Beaver Meadow, Pa. (2)	25 ¹	Deister Concentrator ¹
Gilberton Coal Co.	Gilberton, Pa.	35 ¹	Wilmot ⁴
Giombetti Coal Co. (Racket Brook)	Carbondale, Pa. (2)	100 ¹	Chance ⁶
Glen Alden Coal Co. (Woodward)	Edwardsville, Pa. (2)	140	Menzies ⁷
Green Top Coal Co.	Jessup, Pa. (2)	34	Menzies ⁷
Harry E. Coal Co.	Swoyersville, Pa.	22	Menzies ⁷
Hudson Coal Co. (Loree)	Plymouth, Pa. (3)	170 ¹	Wilmot ⁴
Indian Head Coal Co.	Tremont, Pa. (3)	114	Menzies ⁷
Jeddo-Highland Coal Co. (No. 7)	Jeddo, Pa. (2)	55 ¹	Wilmot ⁴
John Conlon Coal Co.	Hudson, Pa.	5 ¹	Deister Concentrator ¹
Moffat Coal Co.	Taylor, Pa.	70	Menzies ⁷
Necho Coal Co.	Donaldson, Pa. (5)	59 ¹	Deister Concentrator ¹
No. 9 Coal Co.	Pittston, Pa.	22	Menzies ⁷
Rhoads Contracting Co. (Park No. 1)	Ashland, Pa. (2)	140 ¹	Wilmot ⁴
Stevens Coal Co.	Trevorton, Pa.	175 ¹	Chance ⁶
	Trevorton, Pa. (4)	125 ¹	Wilmot ⁴
Supreme Anthracite Coal Mining Co.	Peckville, Pa.	125 ¹	Chance ⁶
	Peckville, Pa. (2)	44	Menzies ⁷
Tunnel Ridge Coal Co.	Silver Brook, Pa. (3)	130 ¹	Wilmot ⁴

* Includes contracts for and installation of preparation equipment in existing structures. Where more than one unit of preparation equipment was installed the number appears in parentheses after the plant address.

¹ Clean Coal. ² No. 7 "SuperDuty Diagonal-Deck" table equipment. ³ No. 7 and No. 10 Duplex "SuperDuty Diagonal-Deck" table equipment. ⁴ Hydrotator washing equipment. ⁵ Clean coal. Total capacities as follows: Giombetti, 175 t.p.h.; Supreme Anthracite, 225; Stevens, 325. ⁶ Chance sand-flotation equipment. ⁷ Menzies cone-separator washing equipment. ⁸ Hydrotator washing and classifier equipment. ⁹ Chance sand-flotation and Hydrotator washing equipment.

HIGHER PRIORITIES

Still Leave Need for Materials Economy

Coal, in Line With Its Essential Character, Receives Progressively Higher Priorities Ratings—Growing War Needs Necessitate Further Efforts to Utilize All Materials to the Best Advantage

By J. L. G. WEYSSER

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A REVIEW of coal-mine priorities during 1942 should go back to their beginning in the fall of 1941 and should include a brief outline of developments in general as a background. With the demands of the war industry superimposed on a peacetime economy, some system had to be set up which would direct the flow of materials and the use of producing facilities. The priorities system, which established a series of preference ratings to determine the order of priority of delivery of goods, was expedient as a start. These ratings were first arranged in two groups: A-1, A-2, etc., to A-10, inclusive, for defense industries, with a similar group of B ratings for essential civilian requirements. (The B group quickly fell into the discard.) The priorities system is simply an arrangement which, to use a homely illustration, establishes a series of tickets which determine a purchaser's "place in line" in obtaining deliveries.

The ordinary procedure for obtaining preference ratings involved the submitting of the PD-1 (subsequently the PD-1A) application form. In addition, orders known as "P," or General Preference Rating, orders were issued: These orders determined the relationship between the various classes of users and the preference ratings available to those classes, and defined the conditions under which the various ratings would be assignable. A number of these orders were issued, the early ones covering particularly such classes as machine-tool factories, airplane plants, shipyards and, subsequently, mines.

This system worked as long as there was a fair sized inventory of finished products and unfabricated materials available throughout the country and

as long as the plant facilities of the various processors were not yet overtaxed. However, Dec. 7 and the immediately increased activities in the production of war material for the armed forces and for lend-lease put a tremendous burden on the whole internal economy of the country. Of course, the demands for the armed forces were given preference ratings of the highest order. What took place was a gradual inflation of the priorities system, and the net result, to return to the illustration, was that "the front end of the line was becoming crowded." To trace this course, it will be recalled that eleven more ratings were inserted above the A-2 rating. These were designated as A-1-a, A-1-b, etc., to A-1-k. Subsequently it became necessary to insert the AA rating ahead of the A-1-a, and this trend further led to the creation, in August, of a new series starting with the AAA rating, followed by the AA-1, AA-2, AA-2X, AA-3, AA-4 and AA-5 ratings, the AA-5 being higher than the A-1-a.

Control Orders Issued

With the fundamental goal of conversion of productive facilities to the manufacture of war matériel and with scarce materials and certain bottleneck facilities becoming even more critical, other types of orders were issued. These include the "M," or Conservation, orders (each of which controls a given material), and "L," or Limitation, orders (which control given classes of equipment). These were issued in an effort to control the inflationary tendency of the priorities system as well as to assure the distribution of critical commodities and machines to meet the actual requirements of the war effort.

Both types of orders were primarily to control the material or equipment at its source, as, for example, at the steel mill or the machine-tool plant. These orders function in some cases on an allocation

plan whereby the most important and urgent needs are met first as completely as possible and subsequent needs then are taken care of in the order of their pre-established importance to the war effort. In other cases the restrictive order functions simply by restricting the release of the material or equipment to purchase orders carrying preference ratings above some minimum level. Another plan is that which requires a specific release or preference rating authorization on some specified form of application which will have to pass through the office administering the distribution of the particular material or equipment.

Out of the efforts to meet the shortcomings of the priorities system came the Production Requirements Plan. As set up it was intended to direct the distribution of raw materials and semi-fabricated materials and subassemblies to various plants in accordance with the actual needs of those plants to meet their production schedules from the standpoint both of quantity and time of delivery of materials. The plan continued to use priorities as a measure of relative importance and of the time requirements inasmuch as ratings were assigned for materials. Quantities were specified in an effort to avoid having an oversupply of a given material at one plant while the output from another was suffering for lack of that same material. The Production Requirements Plan also had a second automatic effect. This was the replacement of non-essential production, and hence non-essential consumption, of critical materials by production essential to the war effort. It resulted from making the preference rating applied to the finished products determine the level of preference ratings to be applied to the raw materials to be obtained by the plant.

The next step is the Controlled Materials Plan. Basically its purpose is to schedule the acquisition of ma-

materials, subassemblies, etc., to a given plant in accordance with the actual requirements per unit of finished equipment to be produced. And, of course, the product to be made is to be predetermined from the standpoint of specifications, quantity and essentiality to the war effort. The primary consideration is the confining of the total quantities of materials authorized to those quantities which actually will be available in a given period.

With the foregoing as a background, the developments in the field of mine priorities will now be considered. In recognition of the importance of the mining industry and the essentiality of continued and non-interrupted production of raw materials for the war effort, a general preference rating order, designated as P-56, was issued for the mines in the fall of 1941. From the start, P-56 put mines in a preferred class in comparison with many other industries. For example, the bulk of the industry not directly engaged in the production of war matériel, including such important links in the internal economy as railroads, power plants, communications systems, etc., for a long time had only the A-10 preference rating for operating supplies and maintenance and repair items, whereas P-56 provided the A-8 rating for mines and furthermore made the A-1-a rating available in the event of a breakdown. The A-8 rating was assignable by indorsement—that is, the operator of a mine having a serial number and thus operating under P-56 was privileged to apply this rating in accordance with the provisions of P-56 by indorsing his purchase order. The A-1-a rating was assignable only upon application to Washington and receipt of an authorization to use the rating. Such authorization was issued upon development of information that that rating was necessary. This early preferred position of the mines accomplished much if only by establishing the precedent.

P-56 Amended

As the priorities system underwent a gradual inflation, P-56 underwent a series of amendments which assigned higher ratings in order that the requirements of the mining industry could be met. On Dec. 2, 1941, P-56 was amended to provide the A-3 rating by indorsement for repair parts or repair material for equipment listed in a schedule. This schedule included all equipment essential to the proper operation of mines. The Dec. 2 amendment also made assignable, upon application to Washington and

demonstration of the necessity for new machinery or equipment, the A-3 rating for new equipment and the A-1-c rating for repair materials required to avert an impending breakdown. This was an important point because it recognized the peculiarity of mines as compared to other plants in that frequently a breakdown at one point or of one unit of equipment will completely restrict the output from a mine. The A-8 remained by indorsement for operating supplies and the A-1-a, upon application, for actual breakdowns.

On March 2, 1942, P-56 was amended to provide the A-1-c rating by indorsement for repair parts re-



J. L. G. Weysser

quired to avoid an impending breakdown. This use of the A-1-c rating was restricted by a quota established for each mine operating under P-56, but eliminated the necessity for applications each time a rating in the higher brackets was required to obtain repair materials in time to avert a suspension or restriction of production.

Subsequent amendments in August made the A-1-a rating assignable by indorsement. Still later the indorsable ratings for materials required to insure continued proper operation of the mines were further increased, making the AA-2X rating, and more recently the AA-1 rating, available. These later assignments of the top ratings by indorsement were restricted to pre-established quotas on the basis of actual quantities and specifications of materials. The quotas are based on data submitted in quarterly applications, and upon the development of the latest (PD-400-B) form it was possible to eliminate the previously

required PD-119 monthly report of rated purchases.

It will be noted that the Dec. 2, 1941, amendment to P-56 specifically established the A-3 rating for new mining machinery and equipment essential to the continued or expanded operation of mines. This assignment of the A-3 rating was to serve a two-fold purpose: (1) It was extendable so that the manufacturers of such equipment, upon receipt of the rating, could extend an A-3 preference rating to their suppliers and sub-suppliers in order to obtain delivery of raw materials and subassemblies for manufacturing the machinery or equipment so rated; and (2) inasmuch as the rating could be assigned to a given purchase order for equipment only upon authorization from the proper official in OPM and later WPB, it provided a basis for insuring that the machinery or equipment would go only to mines where it was definitely needed and could be used to the best advantage for the war effort.

Inflation Brings P-56a

However, with the rapid inflation of priorities, the A-3 rating soon became inadequate to get the manufacturers the required material. To meet this situation, a counterpart of P-56 was shortly thereafter acquired. This was known as Preference Rating Order P-56a, and that order, through its subsequent amendments, provided the preference ratings necessary to get the materials required by the manufacturers for the production of rated machinery and equipment. P-56a played an important part in assuring the continued and expanded operation of coal mines to meet the needs of the war effort. However, P-56a was subsequently replaced by the Production Requirements Plan. Likewise, of course, certain of the larger coal-mine operating companies, which qualified from the standpoint of the volume of materials which they needed, were put under the Production Requirements Plan.

The matter of rating new equipment and of assuring sufficient material to the manufacturers for the production of that equipment presents a very real problem. With the increased demands upon the coal-mining industry as a whole, including the requirement in certain areas for reopening abandoned mines and in a number of instances for opening new mines to meet newly created demands for certain types of coal, the requirements for mining machinery very rapidly exceeded the manufacturing plant capacities in so far as the

time element was concerned. These factors made it extremely important to assure the issuance of preference ratings for equipment only for mines where that equipment is the only solution to the problem of meeting the demand for coal essential to the war effort, and to insure an uninterrupted flow of necessary materials to the manufacturers to meet these minimum requirements for new equipment and for the production of repair parts for equipment already in service.

No Serious Stoppages

All through this past year it can be said that, while there were times when particularly critical situations developed in certain categories, in general there were no serious interruptions of the production of coal as a result of lack of materials required for the operation of the mines. There were some interruptions, of course. Some of these were the result of misunderstandings as to the functioning of the priorities system, but in this connection it is only fair to observe that some misunderstandings were to be expected inasmuch as any system which has the task of controlling the production and flow of materials in the entire economy of a nation cannot avoid being complex.

The need for coal in the prosecution of the war effort in this country to meet the requirements of industry—metallurgical coal and coke for the steel and non-ferrous metallurgical industry and fuel for power plants, railroads and manufacturing plants—and essential civilian needs would seem so obvious to those in the industry as to require only passing comment. The response of the coal industry to this demand has been splendid. The briefest reference to production statistics for 1942 in comparison with those for previous years and with recognition of the many problems involved makes any further comment in this direction almost meaningless. At the same time, the critical situation that has developed in Great Britain as a result of neglecting the coal mines is common knowledge. The importance of providing preferential treatment in the control of flow of material and equipment to coal mines is obvious.

However, with the availability of high preference ratings goes the responsibility of seeing to it that no critical material is used in any way which is not essential, and in effect the same thing applies to the use of preference ratings as well. In other words, no preference rating should be used which is higher than that actually required to accomplish a

necessary result. Almost without exception the industry's recognition of this responsibility and its cooperation with the Mining Equipment Division of the War Production Board has been of the highest order. Of course, there have been exceptions, engendered largely by unwillingness to depart from normal purchasing habits. Reference is made here, of course, to requests for high preference ratings to obtain materials from the usual sources of supply when the same materials or suitable substitutes are available from other sources on lower preference ratings. The fact that the usual source of supply is encumbered with orders carrying high preference ratings in itself is an indication that that supplier already has at hand a large number of orders from users of high importance to the war effort, and the addition of still further orders with high preference ratings can at best only serve further to aggravate the problem.

Minimum Needs Provided

The Coal Section of the Mining Equipment Division of WPB has from the start maintained the fundamental policy of endeavoring at all times to assure the distribution to the coal-mining industry of sufficient materials and equipment to meet its minimum needs. The word minimum is used advisedly. It must be borne in mind that the fundamental objective of the War Production Board is indicated by its name. Each application is treated entirely on its own merits. Close contact is maintained with the Office of Solid Fuels Coordination in connection with the coal production and demand situation throughout the country. It is obvious that the production of a given kind of coal on a given distribution system must be correlated with the availability of a given type of mining equipment. The cooperation of the Office of Solid Fuels Coordination has been extremely valuable and of the highest order.

Applications involving mines having serial numbers under P-56 should be made under that order. For other mines, the PD-1A application procedure is available. Certain routine information was and is required for the proper handling of applications for preference ratings. This includes such data as are required for making up the authorization letters and records of preference ratings issued, etc. Trade associations and a number of operating companies have developed and printed forms to facilitate the presentation of these data. However, the fundamental consideration

is the determination of the actual need for the equipment for the proper operation of the mine, and what is to be accomplished by its use, again always with the over-all picture of the coal situation as a controlling factor. Hence the most important information which has been and will continue to be required for a proper recommendation in any particular case is the information as to the need for the equipment from an operation standpoint. Experience has indicated that this information is best prepared by the engineering or operating department of the applicant mine operating company. In applying for authorization to apply a preference rating and thus to obtain delivery on new equipment, the operator of a mine should consider the following points:

Study Need First

1. Is there any other solution to this operating problem which will not require this or other additional equipment or material?
2. If not, is this particular piece of equipment the most economical solution to the problem from the standpoint of material required?
3. Is all other similar equipment now in service in the mine being used to the fullest possible extent?
4. Is any used equipment of the type being sought available?
5. Is sufficient auxiliary equipment essential to the proper use of the proposed new unit available and now in service?
6. Is sufficient manpower available for the full and efficient use of the proposed equipment?

It is gratifying to note, as a result of the effort to maintain a practical standard with essentiality as the basic consideration, that very few of the cases recommended by the Coal Section have been denied. Also, the excellent work of various associations and trade groups in keeping the industry posted on the ever changing situation with respect to priorities and various requirements has been most helpful in the entire problem.

The responsibility of the mine operators in making requests for preference ratings and priority assistance has received comment. In this connection it is desirable to observe that the industry also has a responsibility to itself in submitting information with respect to inventory and needs for materials required from day to day for the operation of the coal mines. Inflated requests can only lead to increasing difficulties for the industry in getting its minimum actual requirements. When the Coal Section

makes representations as to the minimum needs of the industry, against the requirements of all other industries and the total available supplies, and these are based on inflated data and it is later found that the industry suffers no harm from an arbitrary reduction of the quantity of material allocated for its use, it is quite difficult to support subsequent requests.

Any attempt to forecast the shape of the future would be futile, particularly when the subject is so complex and ever changing as is the distribution of materials. It is common knowledge that the priority system has its shortcomings. The Controlled Materials Plan promises to be the soundest distribution procedure yet put into operation. One difficulty with any of the plans is that they must be set up to meet the over-all requirements

of the war production program, and likewise of necessity they usually are designed to meet the characteristics and requirements of war material producing plants and the majority of the industries of the country. The fact that mines and the mining industry have problems peculiar to themselves has made adjustment to some of these plants somewhat awkward and difficult.

The fact remains, however, that the mines must continue producing. Again with the critical situation of the coal industry in Great Britain in mind, it follows that everything proper to meet the minimum requirements of the mining industry of this country—as to materials, equipment and men—consistent with the over-all requirements of the war effort must be done. Critical materials are

going to become even more critical. Our country is in the midst of the gravest test of its history. Coal must be produced if that test is to be met successfully, but, by the same token, now, as never before, is the time for everyone to use all of that ingenuity and resourcefulness which are part of America's heritage. It will be necessary deliberately to do many things which in normal times certainly would not be considered good practice. Many substitutes will have to be used and, even more important, new methods of meeting old and new problems will have to be developed to meet the situation without the use of anything and everything that ordinarily would be available. To borrow a phrase, the primary consideration should be, "if it won't help win the war, forget it."

MANPOWER PICTURE

One of Replacement and Job Control

Raising 10,000,000 Men for the Services Means Heavy Inroads Into Male Labor Supply—Coal Can Help by Proper Replacement Program, Reducing Absenteeism to a Minimum and Working a 42-Hour Week

By **FRANK J. McSHERRY**

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War Manpower Commission

THE OVER-ALL program for meeting the nation's manpower needs has now taken definite form. A many-angled program of supplying the necessary manpower to staff the war plants and essential supporting activities throughout the nation has been undergoing evolutionary change since June, 1940, when the President set up the National Defense Advisory Council.

Early in the spring of 1940 it became evident that labor and industry were going to be called upon for a tremendous effort to prepare our country for war. At that time we had about 500,000 workers in our war industries, whereas England had 4,500,000 and Germany had nearly 12,000,000 workers. The expansion necessitated by our defense program meant the induction of millions of new workers into the defense production lines, as well as the transfer of

millions from peacetime occupations to jobs in war industries. At that time the manpower problem was relatively simple in view of the fact that we had 8,000,000 to 9,000,000 unemployed persons, many of whom possessed the skills needed by expanding defense industries.

With the advent of Pearl Harbor, the tempo of the whole defense program changed to one of war. On Jan. 6, 1942, the President announced a war-production program for 1942 of 60,000 airplanes, 45,000 tanks, 20,000 anti-aircraft guns and 8,000,000 tons of shipping and in addition many other items of military equipment. The 1943 goals must of military necessity be even higher. The United States' authorized war program now stands at 240 billion dollars. Indications are that expenditures for all war purposes will be estimated to be 78 billion dollars for the fiscal year 1943.

In June, 1940, there were 45.1 million people in civilian employment and the armed forces. By Jan. 1, 1943, the figure had grown to about 57 million. By December of 1943

it is estimated that the number will be further increased until there are between 62.5 and 63 million full-time workers in the labor force, including those in the armed forces. It may well be that this estimate is too low and that as many as 65,000,000 will be needed in the labor force at that time.

The President announced recently that the number of men in the armed forces will be increased from an estimated 5.9 million to about 9.7 million by the end of 1943 or early in 1944. The President stated that the Army would increase from around 4,500,000 to 7,500,000; the Navy from nearly 1,000,000 to 1,500,000; and the Marine Corps and Coast Guard from approximately 400,000 to 700,000.

It is estimated that the number of persons employed in war work will increase from 17,500,000 to 20,000,000 during 1943. This estimate also may be low. A large proportion of those 17,500,000 were inducted into war activity by conversion of the firms where they were employed. In addition, as I have just pointed out, 3,800,000 more men will be with-

drawn from the labor market for military service. Almost all of them will have to be replaced by other workers. A great many of these men for the armed forces must come from industries closely associated with the war.

We cannot raise almost 10,000,000 men for the armed forces without cutting drastically into the male labor force. Activities connected with the war will lose just about as many men to the armed forces during 1943 as they have hitherto lost all together. We cannot prevent this loss, but we can plan for replacement. The recruitment of the new workers required for war work and the replacement of those called to the military service will be a harder job than we have yet had. It is estimated that 9,000,000 non-agricultural workers will be put in new jobs or the armed forces during 1943. This figure does not include normal turnover from workers changing jobs within the same industry. It does include new workers needed by industry and replacements required due to inductions into the armed forces and due to death.

Manpower Sources

Where will we find the additional workers needed in 1943?

About 500,000 more workers can be squeezed out of the present pool of about 1,500,000 unemployed. Normal turnover and those who are unemployable always will leave us nearly a million out of work at any one time. About 3,000,000 new women workers must be brought into the labor market. These are women who are not now and have not recently been seeking a job. About 2,000,000 workers, both men and women, must be transferred from their present less essential work to war activities. The remainder of our manpower needs must come from improved efficiency of industry and from greater use of younger and older workers.

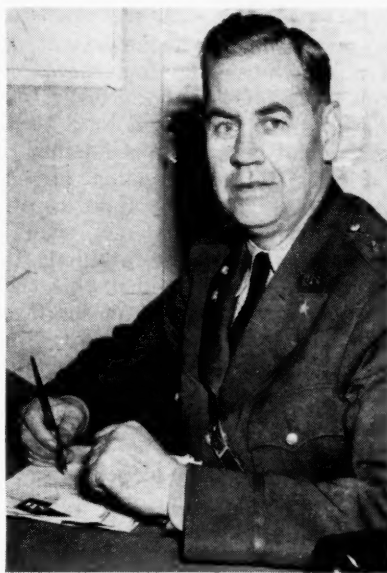
All over the country today, workers and their employers are listening to a new term—job control, or job stabilization—and are wondering how it will affect them. Some have heard it described as "job freezing," an erroneous term, and are apprehensive. Job control, or stabilization, is a new term and a new problem in a nation used to having plenty of workers. It is a device to enable each war activity and community to make the fullest use of its labor—potential as well as present working force. It is based upon policies the National Management-Labor Policy Committee of the War Manpower Commission has recommended.

It is implemented locally only after thorough consultation with management and labor representatives on an Area War Manpower Committee.

The purposes of manpower control are:

1. To protect war production from the disruption caused by employers pirating skilled workers from each other or by workers leaving one job to seek the higher wages offered by another, while at the same time providing means by which workers can change jobs if the change will help the war effort.

2. To enable each war activity to make the best use of the workers available, and to enable workers to use their highest skills.



Brig.-Gen. Frank J. McSherry

3. To stop needless influxes of workers to areas where transportation, housing and health facilities are already taxed to the breaking point.

4. To provide adequate recruiting, training and upgrading programs for workers in every area.

No worker, under such job control, may transfer from one job to another without the approval of his employer or of the United States Employment Service of the War Manpower Commission. This is not, however, a job freeze. Actually, the program encourages workers to change jobs when the change will aid the war effort. Each program provides circumstances under which an employee may transfer. Although each program will be adapted to the local situation, almost all will permit a man to transfer:

1. If the worker is competent to perform higher skilled work than his employer can provide.

2. When the worker is employed for a substantial period at less than full time.

3. When the distance between the worker's home and his job is unreasonably great and when the prospective new job is much closer or more accessible.

4. When the worker has compelling personal reasons for making the change.

In most communities where manpower control is now in effect the employee may get a signed okay from his employer which will be accepted by the new employer to whom he applied for a job, thereby eliminating his going to the U. S. Employment Service. Should the employer refuse to grant such a release, a worker may then appeal to the U.S.E.S. if he feels that the employer's action was unfair.

Any disputes as to the application of the program may be appealed to the Area Manpower Committee. The War Manpower Commission employment stabilization, or job control, plan is designed to enable local citizens to work out the manpower controls for each area, in much the same way as local citizens, sitting on Selective Service boards, now direct all inductions of local men into the armed forces.

Coal Can Help

The coal industry, both management and labor, can do much to solve its own manpower problems. The industry must play its part in the war program by producing more coal per man in 1943 than ever before. The industry can do this only by:

1. Hiring and training new personnel and reducing physical standards as necessary.

2. Decreasing absenteeism from work to an irreducible minimum.

3. Working at least a 42-hour week.

By the democratic nature and the universal character of the machinery by which we induct men into our armed forces, the coal industry must expect to continue to contribute part of its manpower to the armed forces.

In so far as labor is available the industry must replace the men it contributes to the armed forces by hiring new men and training them, and by hiring women, minority groups and handicapped workers in so far as possible. It is management's responsibility in this war effort to

provide at least 42 hours of work per week, and it is labor's responsibility to work such hours. It is the responsibility of both management and

labor to be on the job full time every working day. There can be no "time off" in an all-out war effort. Peacetime standards must give place to the

standards of a nation in an all-out war effort. The coal industry cannot fail in 1943 to meet the requirements imposed upon it.

CAPACITY ADDITIONS

Relatively Small in Bituminous Mining

Getting Output Largely From Existing Operations the Rule—Strict Materials Control Among the Runaway Preventers—Specialty Coals Given Preference—Many Deep Mines Strip Outcrops for More Coal

GETTING the tonnage from existing properties rather than bringing new or reopened capacity into production has marked developments in this war to date in the bituminous industry. In this respect, the present situation differs radically from that which prevailed in World War I, when there was a rush to open new mines. One aftermath of this rush, it will be remembered, was just that much excess capacity to complicate the job of the industry when it became necessary to shorten sail as a result of increased efficiency in consumption and the greater pressure of other fuels.

The difficulty of extra war capacity, however, is one that should not seriously embarrass bituminous mining after the present conflict, barring an

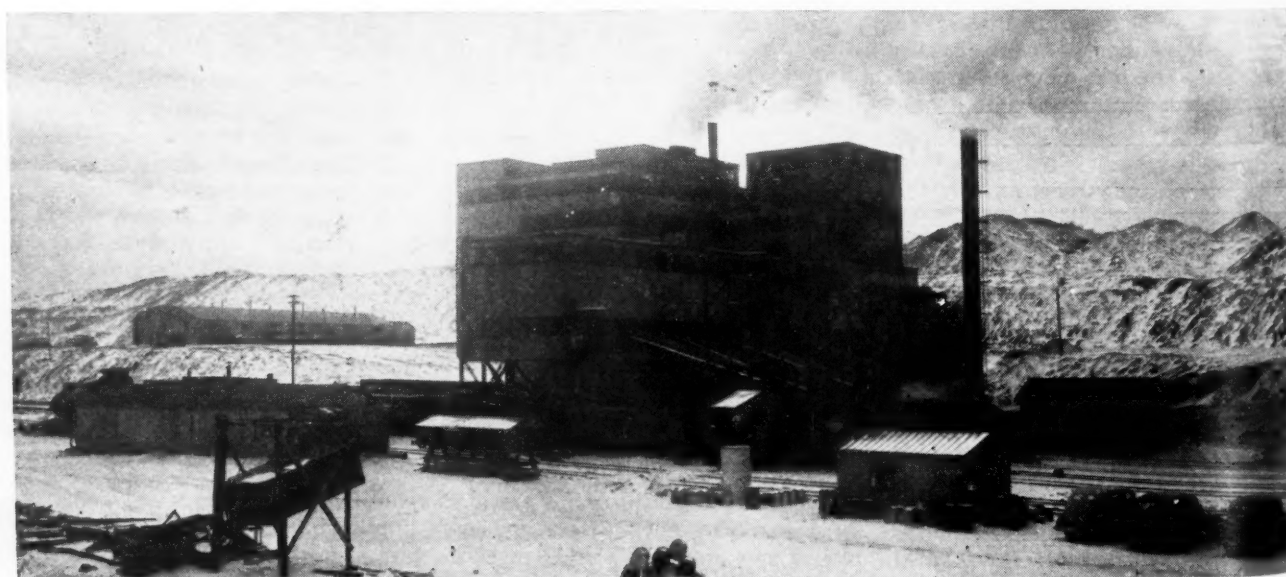
improbable change in the present way of doing things. To fine the point, both operators and, especially, the War Production Board and other government agencies have joined in restricting the construction of new operations primarily to those capable of supplying specialty coals, such as the coking variety, or to supply the needs of consumers and market areas faced with the prospect of shortages. One major medium for attaining this end, of course, is the close control over equipment and materials exercised by WPB, which means in turn a tight control over the opening of new properties or the reopening of old where much new facilities must be installed.

It is true, naturally, that new properties started before materials control

was put on a war basis went ahead to completion. Therefore, several began turning out coal in 1942 and appear in the accompanying table of new mines or old mines reopened and starting to produce in 1942. This table makes no pretense of being complete, especially as far as small mines are concerned, but it is believed that it does include a majority of the big ones.

In a number of cases, new properties represented replacement of existing operations worked out or abandoned. Frequently, material from the old was used to equip the new. Also, as stated, a number of the new operations were started before materials restrictions went on a war basis.

New coking-coal projects included such ones as the Wilkeson Products



This preparation plant serves Flamingo mine, Fairview, Ill. (construction started in 1941), one of the new operations producing in 1942.

Partial List of New and Reopened Bituminous Mines and Mines on Which Construction Was Started in 1942

Company and Mine*	Location	Daily Output†	Company and Mine*	Location	Daily Output†
<i>Alabama</i>			N. Stineman Coal Mining Co. (No. 3).....	South Fork	300 ¹
R. Alabama By-Products Corp. (Labuco)....	Labuco	800	N. Tartan Coal Mining Co. (Tartan).....	Rimersburg	1,100 ¹
R. Republic Steel Corp. (Sayre).....	Sayreton	.....	N. Walker, John D. (Leland No. 12).....	McCartney	400
R. Republic Steel Corp. (Virginia).....	Bessemer	.....	N. Wallwork, George F. (Wallco).....	Sligo	400
R. Roden Coal Co. (No. 3).....	Marvel	.....	N. Wood Coal Mining Co., F. B. (Pine Ridge No. 2).....	Hastings	500
R. Sloss-Sheffield Steel & Iron Co. (Bessie)...	Maben	2,000	N. Wolf-O-Lack Coal Co. (Lone Wolf "A")...	Sligo	300
N. Tennessee Coal, Iron & R. R. Co. (Short Creek No. 19).....	Short Creek	3,500	N. Wolf-O-Lack Coal Co. (Lone Wolf "B")...	Sligo	300
<i>Illinois</i>			NS. Walker, R. S. (Bradford C. Co., Aurora No. 5).....	Leontes Mills	400
N. Black Gold Coal Co.....	DuQuoin	1,000	NS. Walker, R. S. (Bradford C. Co., Aurora Pit No. 1).....	Shawsville	500
NS. Fairview Collieries Corp. (Flamingo)....	Fairview	4,500	NS. Walker, R. S. (Bradford C. Co., Cooper Smo. No. 3).....	Grassflat	400
NS. Pioneer Coal Co.....	Sheffield	.....	NS. Walker, R. S. (Bradford C. Co., Aurora No. 4).....	Shawsville	400
U. Pyramid Coal Corp.....	Pinckneyville	.....	R. Saxman Coal & Coke Co. (Harrison).....	Que Creek	.....
N. Truax-Traer Coal Co.....	Elkville	.....	<i>Utah</i>		
R. Victory Coal Co. (Penwell).....	Pana	.....	U. Columbia Steel Co. (Defense Plant Div.) (Geneva).....	Horse Canyon	8,500
<i>Indiana</i>			R. Kaiser Co., Inc., by Utah Fuel Co. (Sunnyside).....	Sunnyside	3,000
N. Knox Consolidated Coal Corp. (No. 5)....	Bruceville	3,000	<i>Virginia</i>		
N. Linton-Summit Coal Co. (Templeton No. 4)	Sullivan	2,000	N. Margaret Ann Coal Co.....	Conaway	.....
U. Pyramid Coal Corp.....	Seeleyville	4,000‡	R. Stonega Coke & Coal Co.....	Big Stone Gap	.....
N. Standard Coal Co. (Julian No. 5).....	Frichton	2,000	<i>Washington</i>		
<i>Kentucky</i>			R. Atlas Coal Mines, Inc. (Atlas).....	Morton	.....
N. Belfry Coal Co.....	Belfry	.....	N. D. & F. Mining Co. (Bucoda).....	Bucoda	.....
N. Blue Diamond Coal Co.....	Chevrolet	.....	R. Franklin Gem Coal Co. (Franklin Gem)...	Black Diamond	.....
N. Cinderella Coal Corp.....	Hatfield	.....	R. Husky Coal Mining Co. (Husky).....	Ravensdale	.....
N. Derifield Coal Co.....	Pinson Fork	.....	N. Martin, Wallace (Beaver).....	Coquille, O.	.....
R. Jennys Creek Coal Co. (Jennys Creek)....	Paintsville	125	N. May Valley Coal Co. (Coalfields).....	Renton	.....
N. Low Ash Coal Co. (Dalton truck tippie)...	Pikeville	250	R. National Coal Co. (National).....	Cumberland	.....
N. Melva Coal Co. (Melva).....	Drift	50	R. O'Kay Coal Co. (O'Kay).....	Buckley	.....
R. Miller Coal Co. (Miller No. 2 truck tippie)	Regina	275	U. Wilkeson Products Corp.....	Wilkeson	.....
N. Nickels Coal Co. (Nickels truck tippie)....	Estill	100	<i>West Virginia</i>		
N. Peerless Darby Coal Co.....	Totz	1,000	N. Alvarez, Manuel (Lambert's Run).....	Harrison Co.	50 ²
Pikeville Coal Co. (Pikeville truck tippie)...	Pikeville	550	N. Ames Mining Co. (Ames).....	Fayette	14 cars
N. R. C. Tway Coal Co.....	Harlan	1,000	N. Big Eagle Coal Co.....	Mohawk	.....
U. Republic Steel Corp.....	Pike County	.....	N. Clark Coal Co. (Junior No. 7).....	Marion Co.	225 ¹
R. Semet-Solvay Co. (Henry Clay).....	Lookout	1,750	NS. Consolidation Coal Co. (No. 22-A).....	Marion Co.	450 ²
N. Sizemore Mining Corp. (Turner 3-4).....	Drift	200	NS. Consolidation Coal Co. (No. 84-A).....	Harrison Co.	650 ²
R. South-East Coal Co. (LaViers).....	Millstone	1,150	NS. Consolidation Coal Co. (No. 84-B).....	Harrison Co.	1,000 ²
R. Utilities Elkhorn Coal Co. (Esco No. 10)...	Esco	1,600	NS. Consolidation Coal Co. (No. 88-A).....	Harrison Co.	300 ²
<i>Missouri</i>			NS. Consolidation Coal Co. (No. 90-A).....	Harrison Co.	700 ²
NS. Hume-Sinclair Coal Co.....	Foster	.....	N. Cornell Coke Co. (Yale).....	Monongalia Co.	125 ²
NS. Pioneer Coal Co. (No. 3, replacing No. 1)...	Walker	.....	N. Deepwater Coal Co.....	Deepwater	400
<i>Oklahoma</i>			NS. Eureka Coal Co. (Webster No. 1).....	Taylor Co.	450 ²
U. McAlester Fuel Co.....	Carbon	.....	N. Gay Mining Co. (Timbar).....	Gilbert, W. Va.	1,500
U. McAlester Fuel Co.....	Carbon	.....	NS. Home Const. Co. (Vulcan).....	Harrison Co.	400 ²
U. McAlester Fuel Co.....	McCurtain	.....	N. Johnson Coal Co. (No. 2).....	Taylor Co.	100 ²
N. Paris-Purity Coal Co.....	.....	.....	N. Kray Coal Co. (Ream No. 7).....	Preston Co.	65 ²
NS. Sooner Coal Mining Co.....	Oologah	.....	NS. Lanark Coals, Inc.....	Lanark	9 cars
<i>Pennsylvania</i>			N. Mary Frances Coal Co. (No. 2).....	Ingram Branch	6 cars
N. Allegheny River Mining Co. (Ringgold No. 3).....	Sprinkle Mills	800 ¹	R. Maryland New River Coal Co. (Dubree No. 3).....	Winona	3 cars
N. Allegheny River Mining Co. (Chickasaw No. 2).....	Chickasaw	1,000 ¹	R. Maryland New River Coal Co. (Dubree No. 5).....	Winona	3 cars
R. Berwind-White Coal Mining Co. (Eureka No. 3).....	Windber	370 ¹	R. Miller Coal Co. (No. 1).....	Preston Co.	100 ¹
N. Black Beauty Coal Co.....	Shamrock	.....	R. New River Coal Co. (Graham).....	Mt. Hope	5 cars
N. Brookwood Shaft, Inc. (Nos. 2 and 3).....	Brookwood	500 ¹	NS. Nuri Smokeless Coal Co. (Marrow).....	Winona	3 cars
N. Cambria Fuel Co. (Cambria No. 4).....	Shanksville	650 ¹	N. Princess Pat Coal Co.....	Preston Co.	60 ²
N. Cambria Mills Coal Co. (Cambria Mills No. 5).....	Glasgow	100 ¹	N. Queen, Carl L.....	Upshur Co.	70 ²
NS. Carrier & Son (Harlan No. 6).....	Summersville	500 ¹	R. Raleigh Coal & Coke Co. (Black Knight 7)...	Raleigh	10 cars
NS. Carrier & Son (Harlan No. 7).....	Summersville	500 ¹	R. Roaring Creek Coal Co. (Hart No. 1).....	Randolph Co.	50 ²
N. Center Hall Coal Mining Co. (No. 1).....	Osceola Mills	150 ¹	R. Rock Lick Coal Co.....	Concho	2 cars
NS. Clarion Coal Mining Co. (Limestone)....	Sligo	300 ¹	NS. Sherrodsville Mining Co. (Meadowbrook)...	Harrison Co.	700 ²
N. Clearfield Bituminous Coal Mining Corp. (Arcadia No. 2).....	Arcadia	100 ¹	R. Simpson Creek Collieries Co. (Galloway No. 3).....	Barbour Co.	1,500 ²
NS. Elba Coal Co., Inc. (Elba No. 2).....	Madera	500 ¹	N. Stover Smokeless Coal Co. (Jonancy)....	Piney View	4 cars
NS. Hawk Run Coal Mining Co. (Coaldale 26-B).....	Munson	100 ¹	<i>Wyoming</i>		
NS. Hawk Run Coal Mining Co. (Coaldale 28-A).....	Munson	100 ¹	U. Union Pacific Coal Co. (Stansbury).....	Reliance	5,000
NS. Hawk Run Coal Mining Co. (Coaldale 28-B).....	Munson	100 ¹	R. Union Pacific Coal Co.....	Rock Springs	.....
U. H. C. Frick Coke Co.....	Leisenring	10,000	* Letters preceding each listing indicate, as far as information was available, the following: N, new operation; R, existing operation reopened or rehabilitated; U, new operation under construction. The letter S indicates a stripping operation. Mines brought into production in 1942 are listed, although construction may have started earlier.		
U. H. C. Frick Coke Co.....	Greene Co.	6,000	† With some exceptions, the daily output figures are either the rated tonnage (achieved or ultimately expected) or the average or approximate production. In a few instances of mines being developed, the daily output figures are those prevailing at the time of the survey. Where no definite figures could be obtained, or the output was only a few tons or, at present, less than 500 tons a month, as in the case of all but one of the Washington properties, the spaces were left blank.		
R. Hillman Coal & Coke Co. (Black Diamond)	Monongahela City	800 ¹	‡ Deep mines opened from old or existing strip pits.		
N. K. & R. Coal Co. (River Hill No. 1).....	Kylertown	250 ¹	¹ Approximate daily output.		
N. Kenbrook Coal Co. (No. 1).....	Sligo	1,000 ¹	² Average daily output.		
N. McGarey Coal Mining Co. (No. 1).....	Brookville	500 ¹			
N. Mack Coal Co. (No. 4).....	Homer City	150 ¹			
N. Marston Coal Co. (Indian Head No. 1).....	Indian Head	500 ¹			
N. Maurer, F. R. (Carnwath).....	New Millport	200 ¹			
NS. F. C. Morgan Coal Co. (Morgan No. 2)....	Corsica	600 ¹			
NS. P. & G. Coal Co. (Oak Valley).....	Corsica	500 ¹			
NS. P. & G. Coal Co. (Holden).....	Corsica	500 ¹			
N. Peerless Coal Co. (Peetage No. 2).....	Windber	100 ¹			
N. Pine Hill Smokeless Coal Co. (Ponfeigh 6A)	Berlin	100 ¹			
R. Riddlesburg Coal Co. (Brown).....	Riddlesburg	250 ¹			
N. River Hill Coal Co. (No. 2).....	Kylertown	200 ¹			
N. Stichel, A. C. (Flack).....	Stoyestown	300 ¹			

Corp., in Washington; Columbia Steel and Sunnyside, in Utah; three mines being constructed by the McAlester Fuel Co., in Oklahoma, and others in Pennsylvania, West Virginia, Kentucky and Alabama.

The tabulation also shows a substantial number of new stripping operations in the East and South, especially Pennsylvania and West Virginia. While detailed reports were not received for western Pennsylvania, general information shows that strip-

ping additions were as active there as in central Pennsylvania and northern West Virginia, the objective being, among other things, a greater supply of coking coal.

Many of the strip properties in the East and South were opened by companies already operating deep mines as a quick, cheap way of building up tonnage. Contrariwise, some stripping companies in the Middle West opened or were preparing to open slope mines, with others interested in the subject.

How much additional capacity was added by the new and reopened properties put in production in 1942 is difficult to say. But available evidence indicates that it is not as much as might appear on the surface, as there were heavy closings in some regions in addition to properties replaced. In one State, according to reports, some 30,000 tons of daily capacity was junked or scheduled for junking, although not all had been producing in late years.

MECHANICAL EQUIPMENT

Shows Sales Drop While Tonnage Rises

Mobile Loader Sales Off 4.3 Percent in 1942—Conveyor Sales Also Drop While Scrapers Show Increase—Tonnage Mechanically Loaded and Cleaned, However, Continues Its Steady Rise of Recent Years

By **W. H. YOUNG,**
R. L. ANDERSON,
G. A. LAMB
and **JOHN W. BUCH***

SALES of mechanical loading equipment for use in underground coal mines decreased in 1942 from 1941. Installations of mechanical cleaning equipment at bituminous mines also were less in 1942 than in 1941. This was due in part to some of the manufacturers devoting a portion of their facilities to direct defense work.

The total capacity of mechanical-loading equipment sold to the bituminous coal, anthracite and lignite industries in 1942 was 7.7 percent less than that of 1941 and the capacity of mechanical-cleaning installations at bituminous mines was 20 percent less in 1942 than 1941.

This survey was made possible by the courteous cooperation of all known manufacturers of mechanical loading and cleaning equipment in the United States, supplemented with data from various trade journals.

During 1941 there were 186,667,250 net tons of underground bituminous

coal and lignite mechanically loaded, and 13,441,987 net tons of underground anthracite, a total of 200,109,237, or 39 percent, of the total production from underground mines. In 1940, 34 percent of the total bituminous, anthracite and lignite underground production was loaded mechanically.

Bituminous coal mechanically cleaned in the United States in 1941 amounted to 117,539,522 net tons. This figure includes Alaska, which had one cleaning installation that produced 69,665 net tons of mechanically cleaned coal. Total production of

bituminous coal and lignite in the United States and Alaska was 460,771,500 net tons in 1940 and 514,149,245 net tons in 1941. Twenty-two percent of the total output of 1940 and 23 percent of the 1941 was produced as mechanically cleaned coal.

Sales of Mechanized-Loading Units by Types—Table I shows the number of units of mechanized-loading equipment sold to bituminous coal, anthracite and lignite mines for underground use, as reported by manufacturers, for the years 1935 to 1942, inclusive.

Total number of mobile loaders sold decreased from 368 in 1941 to 352 in

TABLE I—UNITS OF MECHANICAL LOADING EQUIPMENT SOLD TO BITUMINOUS COAL, ANTHRACITE, AND LIGNITE MINES FOR UNDERGROUND USE IN THE UNITED STATES, AS REPORTED BY MANUFACTURERS, 1935 TO 1942, INCLUSIVE

	1935	1936	1937	1938	1939	1940	1941	1942	Percent Change, 1942 from 1941
Type of equipment:									
Mobile loaders.....	115	344	292	241	292	233	368	352	-4.3
Scrapers ¹	22	28	29	10	26	39	11	29	+163.6
Conveyors ²	681	994	1,095	990	1,311	1,762	2,130	*1,491	-23.0
Pit-car loaders.....	28	11	32	139	2	3	10	2	-80.0
Total, all types.....	846	1,377	1,448	1,380	1,631	2,037	2,519	*1,874	-25.0
Number of manufacturers reporting.....	28	28	28	29	31	32	32	28	-12.5

¹ Reported as scrapers or scraper haulers and hoists.

² Includes hand-loaded conveyors and those equipped with duckbills and other self-loading heads. Sales of both loading heads and shaker conveyors are counted for years 1935 to 1941, inclusive, but the figure for 1942 does not include loading heads separately; see text for additional explanation.

* Not comparable with previous years; see note ¹.

* Messrs. Young, Anderson and Lamb are members of the Economics Branch, Bituminous Coal Division; Mr. Buch is Chief, Coal Economics Division, Bureau of Mines, U. S. Department of the Interior. Printed with permission of the director of the Bituminous Coal Division and the director of the Bureau of Mines.

TABLE II.—TOTAL NUMBER OF UNITS OF MECHANIZED LOADING EQUIPMENT SHIPPED FOR USE IN EACH STATE OR REGION IN 1942

(L — Mobile loading machines; P — Pit-car loaders; S — Scrapers; C — Conveyors)

State and region	Number of units of all types shipped in 1942	Types of equipment in approximate order of capacity in 1942
Northern Appalachian States:		
Pennsylvania.....	309	L.C.S.
Ohio.....	106	C.L.
Southern Appalachian States:		
West Virginia.....	565	C.L.S.P.
Virginia.....	47	C.L.
Kentucky.....	113	L.C.
Alabama.....	136	L.C.S.
Tennessee.....	23	C.
Middle Western States:		
Illinois.....	60	L.C.
Indiana.....	15	L.C.
Trans-Mississippi States:		
Arkansas, Oklahoma and Iowa.....	44	C.S.L.
Colorado.....	25	C.L.
Montana and Utah.....	61	L.C.S.
New Mexico, North Dakota and Washington.....	5	L.C.
Wyoming.....	27	C.S.
Total bituminous and lignite	1,536	L.C.S.P.
Pennsylvania anthracite.....	338	C.S.
Grand total.....	1,874	L.C.S.P.

1942, or 4.3 percent. Although 1942 sales were less than 1941, they were the second highest year on record. Sales of scrapers rose from 11 in 1941 to 29 in 1942, an increase of 163.6 percent.

Conveyor sales in 1942 amounted to 1,491 units. This figure does not include sales of duckbills, which have been included in all previous years. Therefore, the figure for 1942 is not comparable with 1941 or earlier years. However, the capacity of conveyors sold in 1942 was 16.5 percent less than the capacity of similar sales in 1941. By excluding sales of duckbills some of the overlapping of conveyor sales is eliminated. For instance, in 1940 there were 2,919 conveyors, hand-loaded and those equipped with duckbills, in active use at bituminous coal and lignite mines, as reported by mine operators. By adding 1940 bituminous and lignite conveyor and duckbill sales of 1,573 units, there appears to be 4,492 units available for use in 1941, whereas the number reported in active use by mine operators was 3,595, or 897 less. This difference of 897 represents idle or worn-out and obsolete equipment, duplications in reporting sales, and a small number of conveyors which were used in conjunction with mobile loaders.

Pit-car loader sales dropped to the low figure of 2, which equals the lowest previously recorded, that for the year 1939.

Regional Distribution of Sales—Table II shows the total number of units of mechanical-loading equipment of all types sold in the various States and regions in 1942. Types of equipment sold in approximate order of capacity are shown by letter symbol. For example, 309 mechanical-loading units

of equipment were sold in Pennsylvania. In this total of units sold, mobile loaders (indicated by "L") furnished the largest addition to capacity and conveyors ("C") furnished the second largest addition, followed by scrapers ("S"). Capacities are based on actual performance as reported in

TABLE III—SALES OF MECHANICAL LOADING EQUIPMENT IN 1942 COMPARED WITH TOTAL NUMBER IN ACTIVE USE IN PRECEDING YEARS

	Number of Machines in Active Use as Reported by Mine Operators										Number of Machines Sold as Reported by Manufacturers in 1942
	1933	1934	1935	1936	1937	1938	1939	1940	1941		
Bituminous and lignite mines:											
Mobile loading machines.....	523	534	657	980	1	1,405	1,573	1,720	1,985	352	
Scrapers.....	93	119	78	106	1	117	131	116	109	15	
Pit-car loaders.....	2,453	2,288	2,098	1,851	1	1,392	873	697	607	2	
Conveyors equipped with duck-bills and other self-loading heads.....	132	157	179	234	1	346	559	656	788	2	
Hand-loaded conveyors—number of units.....	525	574	670	936	1	1,526	1,834	2,263	2,807	1,167	
Anthracite mines (Pennsylvania):											
Mobile loading machines.....	18	14	1	4	5	5	5	4	4	14	
Scrapers.....	455	517	507	504	539	545	535	547	503	14	
Pit-car loaders.....	19	25	22	5	5	5	5	5	5	14	
Conveyors equipped with duck-bills and other self-loading heads.....	12	13	30	5	5	5	5	5	5	2	
Hand-loaded conveyors—number of units.....	940	1,338	1,563	1,790	1,855	1,831	1,997	2,189	2,432	324	

¹ Data for 1937 not available for bituminous and lignite mines.

² Included with hand-loaded conveyors. In sales for 1942 loading heads were not counted as a separate unit.

³ Includes conveyors equipped with duckbills.

⁴ Included with scrapers.

⁵ Included with hand-loaded conveyors.

⁶ Includes mobile loading machines.

⁷ Includes pit-car loaders and conveyors equipped with duckbills and other self-loading heads.

⁸ Includes mobile loading machines, pit-car loaders, and conveyors equipped with duckbills and other self-loading heads.

TABLE IV—COMPARISON OF MOBILE LOADERS, SCRAPERS, AND CONVEYORS IN ACTUAL USE IN 1941 WITH SALES REPORTED IN 1942, BY REGIONS

State and Region	Mobile Loaders		Scrapers		Conveyors	
	In Use in 1941	Sales in 1942	In Use in 1941	Sales in 1942	In Use in 1941	Sales in 1942 ¹
BITUMINOUS AND LIGNITE MINES						
Northern Appalachian States:						
Pennsylvania.....	373	116	26	2	734	191
Maryland.....					28	
Ohio.....	122	31			153	75
Michigan.....					5	
Southern Appalachian States:						
Alabama.....	29	32	48	4	330	100
Kentucky.....	142	32			284	81
Tennessee.....	3				90	23
West Virginia.....	464	75	5	3	1,077	485
Virginia.....	41	2			111	45
Middle Western States:						
Illinois.....	540	28			20	32
Indiana.....	135	13			14	2
Trans-Mississippi States ²	136	23	30	6	749	133
Total bituminous and lignite.....	1,985	352	109	15	3,595	1,167
ANTHRACITE MINES						
Pennsylvania.....	3		505	14	2,432	324
Grand total.....	1,985	352	614	29	6,027	1,491

¹ Includes conveyors equipped with duckbills.

² Includes Arkansas, Colorado, Iowa, Montana, New Mexico, North Dakota, Oklahoma, Utah, Washington, and Wyoming.

³ Mobile loaders included with scrapers.

⁴ Includes pit-car loaders and duckbills or other self-loading conveyors.

1941 by mine operators. Of all mechanical-loading equipment sold in 1942, mobile loaders furnished the greatest added capacity, with conveyors, scrapers and pit-car loaders following in order named.

Types of Machines Compared With Units in Use—Table III shows the number of the different types of mechanical-loading equipment in active use since 1933. Mobile loaders in use in bituminous and lignite mines as reported by mine operators increased from 523 in 1933 to 1,985 in 1941. Scraper units in use at bituminous and lignite mines show little change, increasing from 93 in 1933 to 109 in 1941. At bituminous and lignite mines, conveyors equipped with duckbills and other self-loading heads in active use increased 497 percent and the number of hand-loaded conveyors increased 435 percent from 1933 to 1941. Mechanical-loading equipment of all types in active use at bituminous and lignite mines as reported by mine operators increased from 3,726 in 1933 to 6,296 in 1941, an increase of 69 percent, while all types in use at anthracite mines increased from 1,444 to 2,937, or 103 percent, during the same period.

Total sales of all types of mechanical-loading equipment sold to the bituminous and lignite industry in

1942 amounted to 1,536 units, which was 24.4 percent of the total number in active use in 1941, while the total number of units sold to the anthracite mines in 1942 was 338, or 11.5 percent of the total in use in 1941.

Types of Equipment Purchased by Regions in 1942—The number of mobile loaders, scrapers and conveyors shipped into the various States and groups of States in 1942 and the number of units in actual use in 1941 are shown in Table IV. All of the 352 mobile loaders sold in 1942 were shipped to bituminous coal and lignite mines. Pennsylvania bituminous mines received the largest number of mobile loaders sold in 1942, with West Virginia in second place and Alabama and Kentucky tied for third.

There were 29 scraper units sold in 1942, the bituminous mines receiving 15 units and the anthracite 14. No scraper units were sold in 1942 for use in lignite mines.

Conveyor sales in 1942 in relation to the number in actual use in 1941 were greater in the Middle Western States than in any of the other regions.

Trackless Gathering Equipment—Sales of self-powered rubber-tired trackless-haulage units increased in 1942 over 1941. Sales were made in eight States; Pennsylvania received the largest number, and West Virginia,

Kentucky, Alabama and Ohio followed in the order named. These units, which are generally called "shuttle cars," are used to transport the coal from the mobile loader to a transfer station on the haulageway. Mobile loaders also load onto conveyors and directly into mine cars. During 1941 the initial phase of transportation of mobile loader tonnage was as follows: 86 percent by mine cars, 11 percent by rubber-tired trackless haulage units, and 3 percent by conveyors.

Mechanical Cleaning of Bituminous Coal—During 1942 installations of mechanical-cleaning equipment were made in nine States. Total capacity of cleaning equipment sold for use at bituminous coal mines in 1942 is estimated at 6,400 net tons of cleaned coal per hour, as compared with 8,000 net tons capacity sold in 1941. Some of these plants will not be completed until early in 1943, but the sales were all made in 1942. In terms of additional capacity, one-half of the sales were made to mines that did not have cleaning plants and the other one-half were made as additions to equipment or replacements at mines that already had cleaning plants. The greatest capacity of sales was made in Pennsylvania, with West Virginia, Indiana, Alabama and Illinois following in the order named.

BITUMINOUS STRIPPERS

Expand Output and Improve Facilities

Outcrop Stripping Registers Major Gains in the East and South in 1942—Big Shovels Equipped With Special Controls and Automatic Leveling Devices—Trend to Automotive Haulage Gains Momentum

BITUMINOUS stripping continued active in 1942, even though installations of large shovels and auxiliary equipment was reduced—largely as a result of war-time restrictions on materials. Production, however, registered a substantial gain, while some new projects were approved by the War Production Board primarily to safeguard certain consumers and consuming areas against possible deficiencies in fuel supplies.

The old established stripping fields continued to mark up their share of the increased output, but perhaps the

greatest relative increase in opening new properties was in the eastern states. Thus, 1942 witnessed a major growth in outcrop stripping in eastern Ohio, western and central Pennsylvania and northern West Virginia. Even southern West Virginia, Virginia and eastern Kentucky, as well as states farther south, shared in the rising tide of open-pit production.

A quick and easy source of extra coal was a major reason back of much of the eastern and southern activity. This factor was especially notable in regions producing specialty coals or

where new industries had created large new demands. Thus, the coking-coal region of western Pennsylvania, among others, was a beehive of stripping in 1942, in addition to hiking up its deep-mined tonnage—all to satisfy the sharply increased demand for coke, reflected, among other things, in the rebirth, for the duration, of the beehive oven.

While many of these new pits accounted for such relatively small tonnages as 200 to 300 per day, a number turned out 700 to 1,000 or more tons per day. With very few exceptions,

the equipment is powered with internal combustion engines. Shovels dominate as stripping units. In many cases, these are standard contractors' units, but in others, especially where the operators already were in the business, special small shovels designed for stripping are employed, some with booms and sticks long enough to permit stripping and casting overburden up to 35 or 40 ft. in thickness. Dipper size on such shovels seldom exceeds 2½ or 3 cu.yd., and in many instances the shovels are used alternately in stripping and loading. Draglines are in the minority in these eastern operations, which also (in eastern Ohio) include some shovels carrying dippers up to 17 cu.yd.

These latter eastern Ohio operations employ tractor-semi-trailer haulage equipment or large trucks corresponding in size with those used in the big strippings of the Middle West and Southwest. Where smaller equipment is employed, however, the usual haulage unit is the standard end-dump truck with built-up body, although some more or less special dump trucks better designed for stripping have been installed. This equipment normally dumps to bins at the tipples or to railroad cars over ramps.

Strippers Sink Slopes

While many operators in the East have taken to stripping to augment their tonnage, the process has been reversed in the Middle West. In other words, some strip operators in Illinois and elsewhere have opened slope mines to increase their output, while similar steps are under consideration by others. Supplementing stripping operations with deep openings represents nothing new in ideas, as the practice was pioneered many years ago, but it does mark a rebirth of the practice. In several cases, the slopes are not opened from the old pits and some are not even in the same seam. In others, as at the Burning Star mine of the Truax-Traer Coal Mining Co., Elkhart, Ill. (see article starting on p. 91, the opening has been made from an existing pit.

New large stripping shovels put in service last year featured, among other things, amplidyne or "Rototrol" control of one or all of the hoist, swing and crowd motions, plus automatic leveling. A new Marion 5561 knee-action shovel with 35-cu.yd. dipper installed at the Middle Grove property of the Midland Electric Coal Corp., Farmington, Ill., was equipped with General Electric amplidyne control of all three motions, as well as with automatic leveling equipment based on the use of electric eyes (Coal



Outcrop stripping with small shovels increases in the East and South.

Age, November, 1942, p. 56). The Bucyrus-Erie 1050-B stripper with 33-cu.yd. dipper started up by the Fairview Collieries Corp., Fairview, Ill., was equipped with Westinghouse "Rototrol" for swing motion, as well as with mercury-switch automatic leveling. Another 1050-B with several special features was being erected at the end of the year for Foley Bros. at the Rosebud mine of the Northwestern Improvement Co., Colstrip, Mont.

The new controls are designed to prevent severe shocks and strains to the shovels and electrical equipment, simplify the control mechanism, insure prompter and more accurate response to control impulses and provide more rapid and smoother acceleration and retardation, all resulting in lower maintenance and higher production. Experience during the year tended to prove the worth of all these claims. Automatic leveling, whether by electric eye or mercury switch, apparently showed its advantages in saving time in moving as well as in smoother shovel operation.

Another new wrinkle, on a loading shovel, makes two d.c. generators do the work of three and shortens the length of the m.g. set. On this 85-B machine, one generator with four brush holders drives the swing and crowd motors by a dual-wiring system. One armature delivers two independent currents for the motions stated, this with the Ward Leonard system of control.

Aside from new machines, there was considerable moving of equipment already in service, supplemented, in many cases, by substantial rebuilding. The same applied to draglines, and in addition new ones put into service included the Page 621-S walker

at the Rushville (Ill.) truck mine of the Schuyler Coal Corp. Diesel-operated, the unit is fitted with a 6-cu.yd. bucket, with a 7-yd. unit for use where overburden conditions are favorable. Boom length is 135 ft. The bucket motions are operated by one engine through clutches. The swing motion is motor-driven from a diesel-powered generator.

Stacker Installed

Several new 85-B, 100-B and Marion knee-action loaders went into service in 1942 to replace smaller machines, in addition to those accompanying the stripping units at new properties. And one middle western organization installed a stacker to help the stripping unit in deeper overburden. As yet, no details are available on its operation. Some of the newer or more frequently employed features of the new loaders were: webs in the centers of dippers for added strength; shear teeth on each side to cut the rib; and rubber buffers to minimize door slap. In the case of strippers, the trend still was to lightweight high-tensile welded or manganese steel units, with snubbers to reduce slap. A number of the welded type were equipped with heaters to help out in freezing weather. Heaters also were applied to the cylindrical sticks on several machines, according to available information.

Bigger and more powerful overburden drills were installed by a number of companies. Additional rotary drills also were put into service for vertical drilling from the top of the bank. A new method of transporting liquid oxygen was developed, based on the use of "vacuum" tank trucks for transportation supplemented by vacuum

storage tanks. Evaporation is said to be extremely small. New plants for the manufacture and handling of liquid oxygen explosive were designed with an eye to maximum safety in all respects, while more stringent rules regarding handling and use were laid down.

In the power field, safety also came much more to the fore, in part due to the use of war-time rubber cables with a smaller safety factor. Ground protective equipment was installed by an increasing number of strip operators, along with other safeguards to men

and equipment, including ground detectors, improved portable switch houses and other devices and measures. With this, cables received much more attention, more splash- and weatherproof motors were installed in exposed locations, more weather- and dustproof controls were employed, lightning protection was improved, etc., all leading to greater safety, fewer interruptions of operations, longer equipment life and lower maintenance.

Haulage at strip pits continued its evolution toward automotive equip-

ment, with a growing number of dual outfits going into service in 1942. And with the trend toward automotive units, motive power also continued to evolve. In other words, diesel and butane power continued to gain. Lower fuel cost, lower maintenance and more power per cubic foot of space devoted to the engine were among the reasons for the growing use of diesel and butane power units. Truck and trailer bodies tended to increase in size and hydraulic transmissions were being given a trial, although not on any comprehensive scale, despite considerable interest in their apparent possibilities.

Dual Haulage Increases

Dual haulage systems, as stated, showed an increase in 1942. By this is meant systems based on tractors and semi-trailers in the pit hauling to transfer stations where the coal is loaded in rail cars for movement to the preparation plant. An unusual set-up was operated by the Midland Electric organization. With two mines, Middle Grove Nos. 1 and 2, the same fleet of trucks is used for both. One mine loads one shift and when it is over the trucks are loaded on flat cars and hauled to the other mine for service on the second shift. In loading, the trucks, under their own power, run off a ramp onto one end of the trip and across bridges to their proper station. In unloading, the process is reversed.

Scarcity of repair parts and rubber focused increased attention on roads and truck maintenance in 1942. Construction and maintenance of roads registered major gains and modern road-building and maintenance equipment was installed as fast as it could be obtained. Maintenance of trucks themselves was marked by better garages and improved repair facilities reinforced by daily inspection, preventive repairs, timely and efficient lubrication and continuous records of condition covering the entire units and their various parts. Steam cleaners were more widely employed to speed the repair not only of trucks but of all other types of equipment used around strip mines.



This Flamingo shovel, operating at Fairview, Ill., is among the new units fitted with special controls and automatic leveling equipment.

One of the new transfer stations for dual haulage in service in 1942.



MECHANICAL LOADING

Adds to Its Gains at Bituminous Mines

Both Hand-Loaded and Self-Loading Conveyors Widely Installed — Loading Machines Go Into Thinner Seams — Installation of Auxiliaries Active — Shuttle-Car and Transfer-Station Use Increases

MECHANICAL mining of bituminous coal set a hot pace in 1942 despite the fact that war conditions restricted the quantity of loaders, conveyors and auxiliary equipment available. The numbers of the various units were down, but all evidence indicates that if more had been available they would have been snapped up. As the industry went into 1943, indications were that the War Production Board was sympathetic toward taking off some of the brakes, even to the extent of removing certain ordnance work from plants manufacturing mechanical-mining equipment.

Sales of loading machines in 1942 (see p. 86) totaled 352, against 368 in 1941, making 1942 the second best year in history. With this number of sales, machines in use probably rose to some 2,235, compared with 1,985 in 1941. Sales of conveyors (not including duckbills, formerly included in conveyor sales in government statistics) aggregated 1,167 in 1942, a decline from 1941 although exact figures are not available for comparison because of the change in method of reporting sales. Two pit-car loaders and 15 scrapers also were sold in 1942. With this equipment in service, the percentage of the deep-mined output produced mechanically probably rose to 40, against 36.3 percent in 1941.

The major activity in equipment installation, in line with the trend in recent years, was in the eastern and southern states. The trans-Mississippi states, as set forth in more detail in the article on p. 86, got only 23 out of the 352 loaders sold, while 41 went into Illinois and Indiana. Pennsylvania purchased 116 machines and West Virginia 75; Alabama and Kentucky, 32 each; Ohio, 31. The trans-Mississippi states took a little larger share of the conveyor units, although here again the major part went to the East and South, West Virginia leading with a total of 485 bought in 1942, compared with 191 in Pennsylvania, 100 in Alabama and 75 in

Ohio. Shaker-type equipment with automatic duckbills was installed by increasing numbers of mines in 1942. The majority of the conveyors naturally went into the thinner seams, but this was not the invariable rule, as a number of duckbill-equipped shakers were employed in working thicker coal.

Shaker conveyors with ratchet-type duckbills are supplemented by loading machines at the Sunnyside (Utah) property of the Utah Fuel Co., the subject of a comprehensive enlargement and rehabilitation program in 1942 to take care of coking-coal demands by defense industries. This equipment has been accompanied by Sullivan 7-B shortwall and 7-AU track-mounted cutters, the latter having the drills mounted upon them. One Goodman track loader and a Joy 11-BU crawler machine are used with the 7-AU equipment. Jeffrey chain conveyors are employed in driving dip entries, with loading onto the conveyors by hand and cutting with 7-B's. Over 100 new 6-ton mine cars have been put in service. Plans call for later replacement of present light battery locomotives with cable-reel units for secondary haulage, as well as for 15-ton haulage units to replace the 8-ton locomotives temporarily employed. Air is supplied to the faces by Jeffrey "Midget" blowers and tubing.

Pillar Extraction Increased

The Kenilworth mine, Independent Coal & Coke Co., in the same State, worked throughout the year on a new plan (developed after long research and experiment) for mining pillars mechanically in 16 to 17 ft. of coal, increasing extraction from 25 to 30 to 80 to 85 percent (Coal Age, August, 1942, p. 51). Both shaker conveyors with duckbills and Joy loading machines are used in pillar extraction (including old standing pillars), with Goodman and Jeffrey track loaders for development.

Another new operation in Utah,

Geneva mine, Defense Plant Div., Columbia Steel Co., with an eventual capacity of 8,500 tons per day, also will be mechanized, according to reports. Additions were made to loading and conveying equipment by other mines in Utah and neighboring states, such as: National Fuel Co.—Eagle mine, near Denver, Colo., shaker conveyors; Colorado Fuel & Iron Corp.—Frederick mine, Valdez, four additional shaker units and four permissible shortwalls, supplemented by additional cars, locomotives and d.c. conversion equipment; Kebler No. 2, Tioga, two additional shakers plus transformer equipment and underground cable. The Moffat Coal Co., Oak Creek, reported continued higher efficiency than with older methods of mining. Six Jeffrey chain conveyors 600 ft. long and six Goodman duckbill-equipped shaker conveyors are in service three shifts a day.

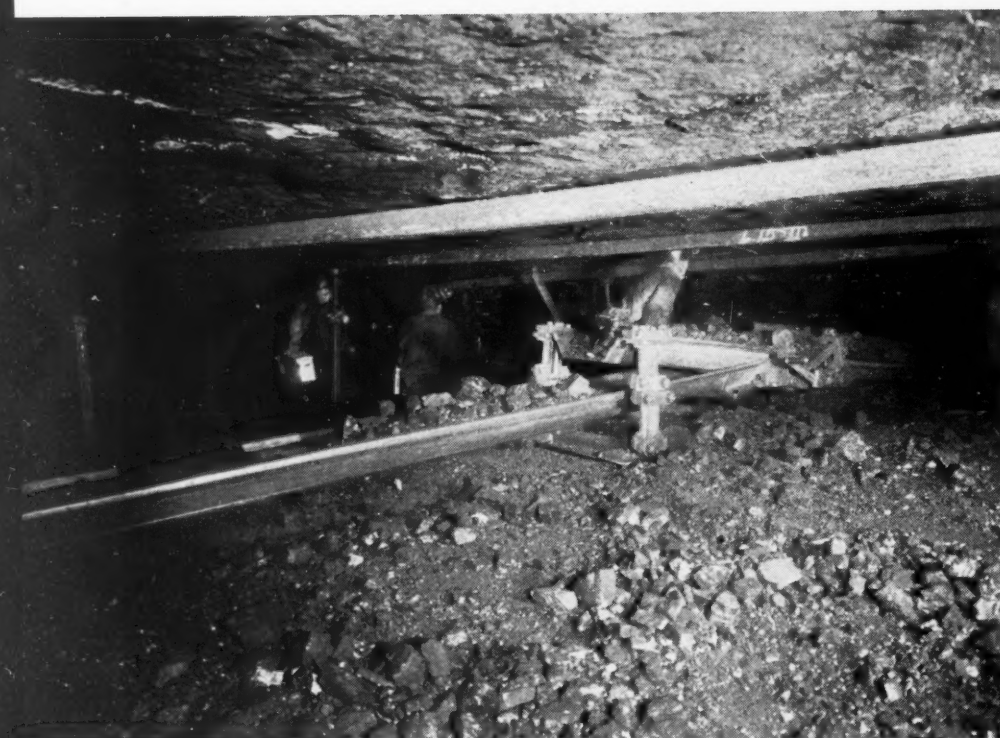
Additional conveyor installations were made in Illinois and Indiana in 1942, as stated, although several were for use behind loading machines. Ohio installations were largely shaker units, many of them equipped with duckbills. The same held true for western Pennsylvania installations, while in central Pennsylvania operators tended to adhere more to the chain-type equipment long employed in that region. Two additional Jeffrey 61-W conveyors and 61-EW elevators, for example, were added to facilities at the Sonman mine, Koppers Coal Div., Eastern Gas & Fuel Associates.

An 1,800-ft. mother-belt conveyor was installed at the No. 5 mine of the Pennsylvania Electric Co., Seward, Pa., along with two new 300-ft. Jeffrey chain conveyors and three additional mining machines. The belt conveyor will decrease the quantity of heading rock that will have to be shot and also raise tonnage per man. With this equipment, No. 5 mine was about 50 percent mechanized.

Southern West Virginia bought many conveyors of both the chain and



Loading machines go into thinner seams and smaller mines.



Self-loading conveyors are adopted by more operators.

Chain conveyors find many thin-seam applications in 1942.



shaker type. Wharton mine, Koppers Coal Div., as an example, was equipped with four Goodman G-20 duckbill-equipped shaker conveyors and three Jeffrey 35-B shortwalls, supplemented by hoists, drills, etc., for development work and to replace hand loading. At Stanaford, also to replace hand loading, three 61-AM room conveyors, one 61-EW elevator and two 61-HG face conveyors were installed. In addition to mobile-loading units detailed later in this review, the Kopperston property installed five 61-AM conveyors, one 61-EW elevator, two 61-HF face conveyors, "Brownie" HKD hoist, 35-BC mining machine and accessories.

Conveyor installations by the Crystal Block Coal & Coke Co. and the Crystal Block Mining Co. were: No. 2 plant, Mingo County, West Virginia, one set Goodman Type GS-15-B-74 shaker conveyors complete with two A-1½ duckbills, and two Jeffrey MM-35-BC shortwalls; No. 4, Logan County, three sets of 61-HG Jeffrey hand-loaded face conveyors and six MM-35-BC cutters, plus a 150-kw. rotary converter. Equipment at the No. 5 plant, Buchanan County, Virginia, was supplemented by 50 additional Sanford-Day drop-bottom mine cars.

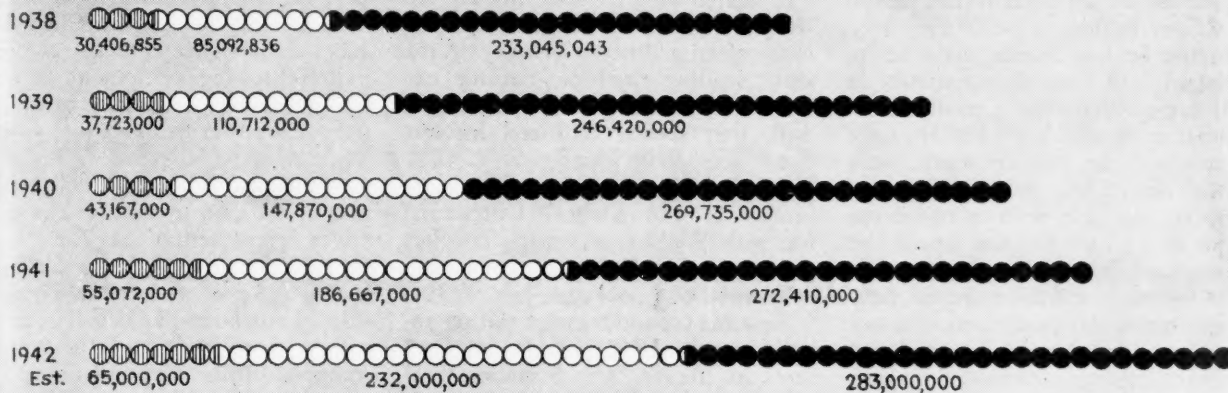
Kentucky Gets Conveyors

Eastern Kentucky activity included: Clover Splint Co., Closplint, six shaking conveyors and two mother belts to work a new section averaging 35 in.; Peerless Darby Coal Co., Totz, new mine to be served 100 percent by hand-loaded conveyors; Southern Mining Co., Insull; Bardo Coal Mining Co., Bardo; and Perkins-Harlan Fuel Co., Liggett, embarked on mechanization programs to use Jeffrey chain equipment.

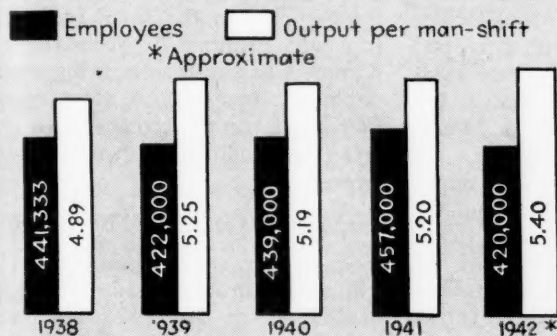
Alabama also experienced an active year in the installation of conveyors and scrapers as well as loading machines. The Alabama By-Products Corp., as a case in point, installed twelve additional conveyors and three mining machines at Bradford mine to further the mechanization program, now accounting for about 75 percent of the tonnage; added four conveyors and four mining machines at Colta, 100 percent mechanized; completed rehabilitation and revamping of Labuco mine, idle since April 1, 1939, and now completely mechanized and supplied with new cars underground and a new preparation plant on the surface; added 40 conveyors, including face conveyors, and 16 mining machines at Praco in working toward complete mechanization and extraction on the retreat system; added 20

BITUMINOUS OPERATING STATISTICS

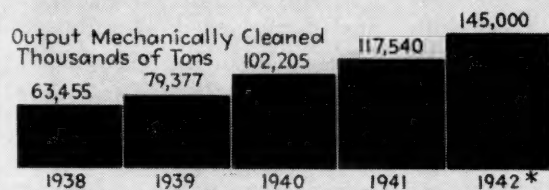
Strip
 Mechanically loaded
 Produced by other methods



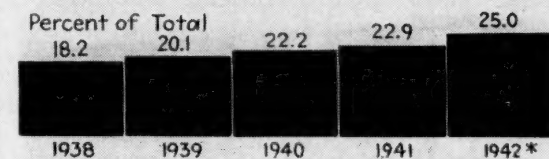
Stripping and mechanical mining register tonnage gains in 1942.



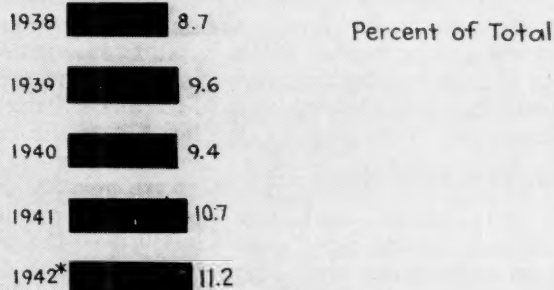
* Approximate
Output per man-shift probably rises in 1942.



* Estimated

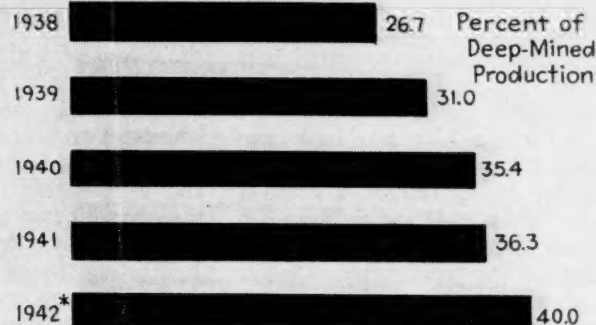


Mechanical cleaning marks up additional gains.



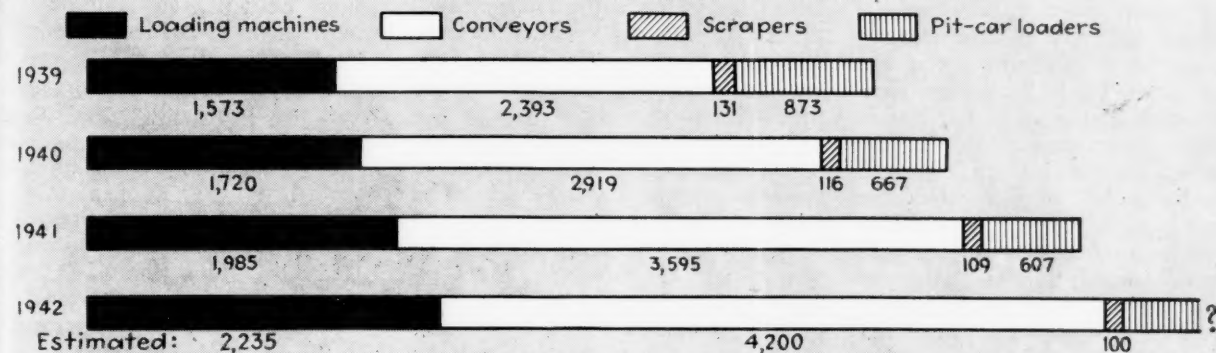
* Estimated

Strip percentage rises in 1942.



* Estimated

Percentage of deep-mined tonnage produced mechanically continues its gains.



Mechanical-mining equipment in use continues rise in late years.

new steel drop-bottom cars at Samoset to maintain output in the face of a longer haul; and added two scraper units to those already in service at Barney, where the tonnage now is approximately 75 percent mechanical or scraper loaded.

In the field of loading-machine installation and use, developments in 1942 were marked by a continuation of the trend toward lower higher-capacity machines for thinner seams, such as the new Clarkson 24 BB track-mounted machine with a minimum height of 24 in. from the top of the rail to the top of the conveyor, with 12-in. wheels, put into service last year. To get maximum performance, many operators installed larger cars and put in service cutting machines, drills and other auxiliaries more fitted for mechanical operation. Shuttle-car installations were active, a number of these being supplemented by mother conveyors for the room headings. There also was a major increase in the installation of large drop-bottom mine cars with transfer stations behind loading machines.

Strippers Start Slopes

Several strip mines went into mechanized deep mining, using slope openings or developing the deep acreage from drifts in old pits. An example of the latter is the Burning Star mine of the Truax-Traer Coal Co., Elkville, Ill. Originally set up for belt main-line haulage, the property now is in process of being converted to a rail haul for main-line movement. Barber-Greene belts, however, are used in the panels to take coal from cable-reel "Koalmobile" shuttle cars serving Joy 11-BU loaders. Cutting is done by Jeffrey 29-U and Sullivan 7-B equipment, with Dooley 474 drills. At the end of the year, after a rather rapid development period, the mine was producing some 50,000 tons a month.

Many operations, however, stuck to conventional mine-car service, although, where possible, adopting the largest car that could be used. Among those adding to equipment was the Cornett-Lewis Coal Co., eastern Kentucky, which acquired a 14-BU loader. A similar loader was added by the Mahan-Ellison Coal Corp., Liggett, Ky., which also supplemented the original 30 with 20 more Sanford-Day drop-bottom mine cars. Along with the trend toward thinner seams was a trend toward loaders in smaller mines, such as that of the Greenbrier Smokeless Coal Co., Charmco, W. Va., which was averaging somewhat over 160 tons per shift (clean coal) from a 48-in. average seam, including

handling about 9 in. of drawslate, with one 14-BU and twelve 4-ton Enterprise mine cars (Coal Age, December, 1942, p. 60).

The Weirton Coal Co., Isabella, Pa., started an additional mining section in 1942 which involved the purchase of an additional Whaley "Automat" loading machine, cutting machine with trailing water tank, post drill, four special cable-reel locomotives (see article starting on p. 101) and 30 new mine cars. These are similar to the 8-wheel Differential cars with Willison automatic couplers and a capacity of 9 to 10 tons originally installed (Coal Age, July, 1938).

New big-car-and-transfer station installations in 1942 included at least three in Illinois. The Seymour Coal Mining Co. ordered 20 7-ton Sanford-Day drop-bottom cars and a transfer hopper for its Freeman Spur mine, Herrin, Ill. Installation of a transfer station to serve one section equipped with track-mounted cutting and loading equipment was in progress at the Mt. Olive & Staunton Coal Co., Staunton, Ill., at the end of the year.

Four Goodman 360 loaders (one a reserve unit for use during major repair and overhauling periods) were installed in the last half of 1942 by the St. Louis & O'Fallon Coal Co., East St. Louis, Ill. The three active machines replaced five obsolete units of another make and are averaging in excess of 500 tons each per shift. Two 2½-ton cars are spotted under the boom at a time for loading. All cars, incidentally, were equipped with A.C.F. trucks and Timken-bearing wheels. Two Goodman slabbers were changed from bottom to breast cutters and a third unit was added. These three machines cut an average of 1,700 tons per day, the excess over the 1,500 tons handled by the loading machines going as cuttings or clean-up by hand. Cuttings are loaded before blasting with Black Diamond No. 15 permissible 1½x6-in. sticks. Five bottom holes and five top holes as followers are drilled in the average place, using No. 473 drills which replaced 472 equipment in 1942. The drills are double shifted, three on the day turn and two at night.

Steel for a transfer station was received and this station is expected to go into operation about Feb. 15. The four conveyors, of the company's own design, employ 60,000-lb.-test chain, two strands per conveyor. Jones reducers driven from 10-hp. G. E. motors by V belts are used. Ten-ton A.C.F. cars (18 purchased) will be used between the loading machines and the transfer station. The cars are 17½ ft. long, 7½ ft. wide and 39 in.

deep. The coal will be loaded into 65-car trains of small cars at a rate of 10 tons a minute. With this change, it is expected to increase loading-machine output to 100 tons per hour, or 700 tons per shift. The transfer station will be supplemented by a block-signal system with automatic switch-throwing equipment to speed up traffic and safeguard men. New shop and power facilities (see p. 101) round out the program.

What probably is the first installation of its kind in transfer stations is under construction at the Rachel (W. Va.) mine of Jones Collieries, Inc., a 100-percent mechanized operation. Long-boomed Whaley loaders will be employed, and the cars are equipped with swinging sides for dumping. This dumping will be done by an unusual power hoist handling two swinging dumps which side-dump the big cars to the small car-loading conveyor running between the two dumps. Since both sides swing out for discharge, these cars can serve any section of the mine, right or left, each being handled by its own individual locomotive.

Shuttle Cars for Thin Coal

Shuttle-car installations went into still more thin seams and more of the smaller mines in 1942. The truck property of the Moore Branch Coal Co., Hitchins, Ky., for example, operated throughout 1942 with a 14-BU loader served by 32-in. shuttle cars (Coal Age, April, 1942, p. 76). Among the new installations in the thinner seams was a Joy loader-shuttle car unit for C. A. Hughes & Co., in central Pennsylvania, where several other installations were made or expanded.

Most of the states where seam thickness and other natural conditions permitted also got shuttle-car equipment in 1942. An active installer of such units was the Koppers Coal Div., which put several units to work in West Virginia. At Federal No. 1 mine, as an example, an additional unit comprised an 11-BU loader, Jeffrey 29-U cutter and three shuttle cars and accessories, aside from 26 storage batteries and two shuttle cars for units already in service.

Two mechanical-loading units were installed at the Koppers' Carswell mine, at Kimball, in southern West Virginia. Each was made up of a 14-BU loader, three Joy 42-D shuttle cars, one caterpillar truck, one Jeffrey 29-U cutter, two Joy elevators and two "Brownie" HKD hoists.

To increase output at its Koppers-ton (W. Va.) development, Koppers, in addition to conveyors, 75 com-

posite cars for No. 1 mine and 21 7-ton composite and 35 10-ton drop-bottom cars for No. 2, installed one butt-entry and two development units at the No. 2 mine. The butt-entry unit comprises two 29-U cutters, two

caterpillar trucks, two 11-BU loaders, six 42-D shuttle cars, four charging panels, one "Brownie" DD hoist and one 30-in.-wide 1,800-ft.-long Joy butt-entry belt. The two development units comprise two 29-U's, two caterpillar

trucks, two 11-BU loaders, six 42-D shuttle cars, four charging panels, two HKD hoists, three 30-in. 600-ft. Joy belt conveyors, two Joy elevators and one Jeffrey L-400 track-mounted loading machine.

BITUMINOUS MINES

Improve Service Equipment and Methods

New and Bigger Mine Cars Installed in 1942—Track Improvements Keep Step—Ventilation Improved by New Fan Units, Shafts and Airways—Additional Steps Taken to Promote Safety and Health

DESPITE the exigencies of war, many improvements in the service to coal loaders at the mine face, human and mechanical, were effected in 1942 and, in 1943 also, operators undoubtedly will be allowed and perhaps even persuaded to make purchases of this sort in larger measure because such service is a necessary ancillary operation to coal production, and without coal the two essentials of war industry—power and heat—will be lacking. Sufficient and efficient equipment is as vital to the production of coal as to the conduct of a battle. In such work also, the introduction of better equipment as the result of experience is as definitely a necessary part of effective operation as similar revisions in the construction of the implements of war.

Though production last year on the whole outran consumption, in places the shoe fit so tight that it pinched the West and the coke industry severely, and, toward the end of the year, indications clearly pointed to the possibility that a general shortage of coal would occur in this present year such that only mechanical development will be able to cure. The pincers of increased demand, worn-out equipment and decreased manpower seem to be closing in on the coal industry.

Among the changes which promise safer and speedier transportation are the use of locomotive "radios" for communicating from the cab of the locomotive with the dispatcher, as established at the Frances mine of the Frances Fuel Co., near Monongah, Marion County, West Virginia; rebuilding of locomotives at the mine

shops by welding and use of regenerative braking on inclines.

On long runs, locomotives have been getting unduly hot, and the hope is expressed that armatures and fields protected by coats of felted or molded asbestos or by a glass weave or improved molded compounds and by ventilation of coils will reduce the number of burned armatures and permit a higher energy expenditure with less fear of untoward consequences. Anti-friction bearings for armatures, grease-sealed axle bearings and greater metal strength give promise also of permitting heavier loads and longer life.

Haulage Overhauled

Meantime, experience is making managers leary of too greatly increasing gradients and length of trips and runs. Just now the coal industry is passing through the same revolution as did the railroads a generation ago and is recognizing that heavier tracks, better ballast and stronger equipment will make greater speeds and longer trips possible, yet with fewer accidents. But speed must not outstrip safety. Maintenance and inspection of mine haulage roads is being given intensive study by the Coal Division of the American Mining Congress.

During the year, the Weirton Fuel Co., at its Isabella mine, in Fayette County, Pennsylvania, added four locomotives which at the time of installation were the largest explosion-tested cable-reel locomotives ever installed in a mine. For details, see the article starting on p. 101. With them were ordered 51 cars, of which 30 were of the eight-wheel "Jumbo"

type for rotary dumping and similar to the 182 previously installed (Coal Age, July, 1938, p. 61). These cars will carry 12 tons without injury when loaded with slate, and have a length between coupler faces of 12 ft. 10½ in., an outside width of 7 ft. and a height of 44 in. when loaded to 10 tons.

Thirteen of the 51 units were flat cars, which after purchase were fitted for supply haulage. They have the same eight-wheel trucks, brakes, Wilson couplers and spring and friction draft gear as the coal cars. The other eight units are special safety-type man-trip cars of entirely new design, the only installation of their type in the United States (Coal Age, November, 1942, p. 51).

Ten-ton cars also are being installed by Jones Collieries, Inc., Rachel, W. Va., for shuttle purposes (see article beginning on p. 91). One hundred additional steel mine cars have been provided at the Frederick mine of the Colorado Fuel & Iron Corp. The Alabama By-Products Corp. also installed 20 new steel drop-bottom cars at its Samoset (Ala.) mine to maintain the output for the longer haulage which continued extension of the mine has entailed. Other new cars became necessary and were supplied with the reopening of its Labuco mine, Jefferson County, Alabama, idle since April 1, 1939.

Stonegap Coke & Coal Co., Big Stone Gap, Va., also for a reopened mine, placed in operation 200 mine cars and a haulage locomotive, and the Crystal Block Coal & Coke Co., 50 Sanford-Day drop-bottom mine cars to add to those already installed

at its No. 5 mine, Buchanan County, Virginia. During the last year all cars at the Black Eagle No. 2 mine, of the St. Louis & O'Fallon Coal Co., East St. Louis, Ill., were equipped with American Car & Foundry trucks and Timken roller-bearing wheels, the haulage roads having become greatly extended with the passage of years.

Eight-ton locomotives have been put into service for main haulage at Sunnyside, Carbon County, Utah, by the Utah Fuel Co., but they will be replaced later by 15-ton units. Secondary haulage, now performed with light battery locomotives, will be undertaken later with cable-reel units. Over 100 new 6-ton-capacity mine cars with swivel couplings for dumping in train and with hand brakes have been put in service. Another Western mine adding cars to its equipment is the National Fuel Co., Denver, Colo. The Stearns Coal & Lumber Co., southeastern Kentucky, added several hundred mine cars in 1942 and the Utilities Elkhorn Coal Corp. installed 50 more composite Enterprise 2½-ton mine cars at its Martin mine, Floyd County, Kentucky, and 25 additional American Car & Foundry all-steel drop-bottom mine cars at its Esco No. 10 mine, Pike County. Another installation was 125 new Sanford-Day 3½-ton drop-bottom

cars at the Lenarue mine of the Southern Harlan Coal Co., Harlan County, Kentucky, along with a 10-ton General Electric haulage locomotive, which improvements were made necessary by the increased acreage acquired. A 15-ton locomotive was installed by the Superior Coal Co., Gillespie, Ill.

Many ventilation improvements have been made, some of which show that operators are no longer obsessed with the idea of getting all they want from introducing fans of increased size or water gage to compensate for the length of headings inevitable after years of operation. Like the St. Louis & O'Fallon Coal Co., they are revamping their ventilation systems to reduce air resistance. At that company's mine a new fan was installed and advantage was taken of the air shaft of the abandoned Eldnar mine, thereby approximating one-way travel, practically eliminating all return air-courses and shortening the air travel about 3½ miles.

Four headings are now used as intake airways, greatly increasing the quantity of air that can be delivered for a given water gage. Provision to prevent excessive stopping leakage had always been made, the headings being driven in pairs with a solid pillar between pairs, but now, with all the headings at the same pressure and all

the air traveling in the same direction, air losses from stoppings have been eliminated. The new fan delivers 150,000 c.f.m.

Another mine that sought better air from a combination of a new fan and air shaft was the Frederick mine of the Colorado Fuel & Iron Corp., Valdez, Colo. At No. 5 mine of the Pennsylvania Electric Co., Seward, Pa., a new main heading, two miles from the main entrance and 4,500 ft. long, was driven to connect two sections of the workings. The intention is to sink an air shaft on this heading to provide sufficient air for future development. Transportation of coal from these sections of the mine will be greatly facilitated by this new heading.

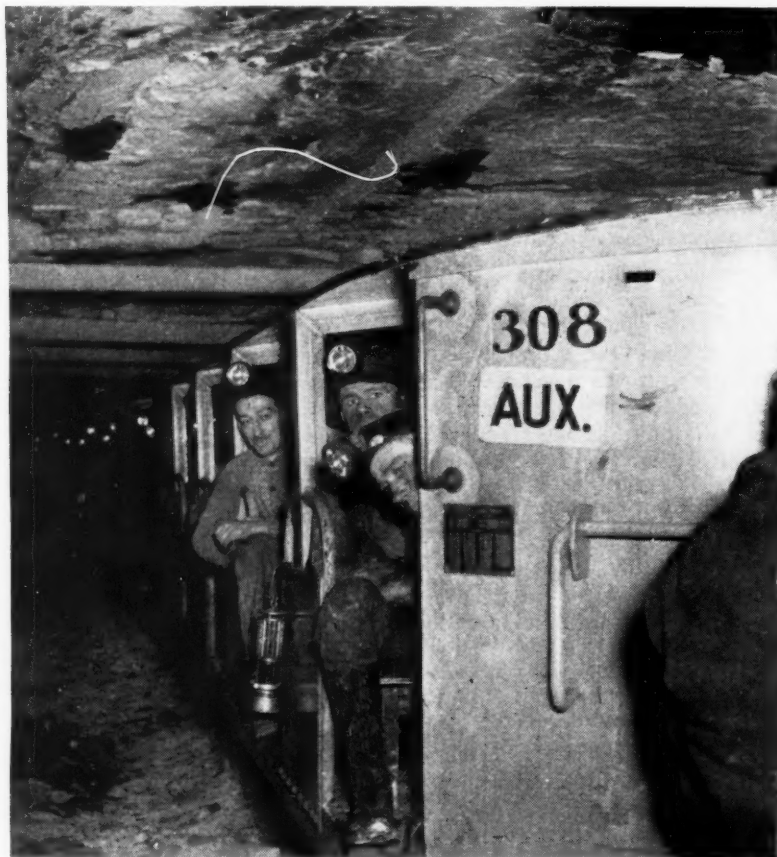
At the Dresser mine, Terre Haute, Ind., Walter Bledsoe & Co. is preparing to confine its operations, beginning some time in the present year, to a definite area, and has provided for that area on up-and-down-cast air shaft, 11,000 ft. from the hoisting shaft, and a Jeffrey Aerodyne fan. A pushbutton man-hoist is provided.

Mine Gets Two Fans

Ventilation became an important problem at the Sunnyside mine of the Utah Fuel Co. when the demand of war industry called for increasing the production of the mine eightfold. Two new 8H84 Aerodyne fans will furnish air to the rehabilitated mine. New Jeffrey Midget fans with canvas tubing supply the faces.

When, late in the year, the Weirton Coal Co. purchased the Hustead mine, which had been abandoned for about twelve years and was full of water, the mine had to be dewatered so that its two slopes and one shaft could be used for ventilation and also to permit mining the coal resource thus added. Consequently at the close of the year two 500-ft. 10-in.-diameter boreholes and one 8-in.-diameter power hole were drilled from the surface for two separate pump stations in the present Isabella workings. The suction line for these two pump stations will be in each case a 200-ft. 6- or 8-in.-diameter horizontal borehole through the solid pillar into the Hustead mine. One pump station will have a capacity of 1,000 and the other of 350 g.p.m. About a year's continuous pumping will be needed to dewater the Hustead mine so that it can be tapped by the Isabella workings. The pumps will be centrifugal and of 200 and 75 hp. respectively.

At the close of the year, Weirton was about ready to turn the wheel of a new Aerodyne fan with a capacity of 200,000 c.f.m. at a 4-in.



New car installations in 1942 included these special man-trip jobs at Isabella

water gage. The fan is housed in concrete and steel and, because of the peculiar layout of the surface works, it had to be installed on top of the duct work of the old centrifugal fan, which will be retained and used as a standby.

This new fan will not only be much more efficient than the older installation but, being driven by a synchronous motor, will aid in power-factor correction. It also has an auxiliary gasoline engine so installed that if the power fails or the fan slows down to 80 percent of rated speed for any reason, the gasoline unit will start automatically, bring the fan to full speed and keep it going without interruption.

A 7-ft. Aerodyne fan also has been installed at the Clover Splint Coal Co.'s mine at Closplint, Ky., to replace an old centrifugal unit, and a 6-ft. Aerodyne at the Cornett-Lewis Coal Co.'s Corlew mine, Louellen, Ky., to provide ventilation for the new territory in its High Splint seam. Each of the Black Mountain Corp.'s Nos. 30 and 31 mines, Kenvir, Ky., installed a Jeffrey 42-in. high-speed Aerodyne fan to augment the existing ventilation equipment. An Aerovane unit was installed at the Monarch mine of the National Fuel Co., in Colorado.

Rock-Dusters Installed

Additional rock-dusters were installed at Lenarue by the Southern Harlan Coal Co. and at Frederick by the Colorado Fuel & Iron Co. A new Cantrell self-propelling mine-air compressor with cable reel and trolley pole of Imperial Bronze Mfg. Co. was installed by the Harlan Central Coal Co., Totz, Ky. The Southern Harlan Coal Co. also installed a 150-ton dump bin where its former kick-back dump was located, providing a belt conveyor from the bin to the rope-and-button conveyor. A bulldozer was purchased for grading roads and with it was constructed a motor-truck supply road up the hillside to the headhouse, thus eliminating the rope-haulage supply line.

A belt conveyor is being installed from the No. 5 mine of the Pennsylvania Electric Co. to the Seward power plant and will be completed during the present year. Using 60-lb. steel, the Cornett-Lewis Coal Co. constructed a 6,500-ft. outside tramroad to haul from a new territory in the High Splint seam. In the same county, Harlan, the Blue Diamond Coal Co. is developing a mine in a seam above the old mine, which is nearly exhausted. This mine will use the old tippie, to which the coal will be brought by two rope-and-button

conveyors and a belt. Connected by an aerial tram, coal is to be lowered from headhouse to tippie at a mine of the R. C. Tway Co. opened Sept. 1, 1942. It is already producing 500 tons daily and is planned for 1,000 tons. It, like the old mine, will work the Harlan seam. Located on the hill opposite that mine, it will lower its cars down the old plane of that operation, now abandoned.

A manway from the mine mouth to a waiting room, 300 ft. back in the mine, was constructed by the Hanna Coal Co. at Willow Grove mine, Neffs, Belmont County, Ohio, near the close of 1942. Now the men can go into the mine to wait for the mantrip. Thus safety is assured from incoming and outgoing locomotives, and the men are protected from inclement weather. A concrete wall separates the haulageway from the passageway.

Mines Get New Houses

Fifty houses were constructed in 1942 by the Koppers Coal Co. for its operations at the Keystone, Carswell and Maitland operations, located respectively in Keystone, Kimball and Maitland, McDowell County; 50 more were erected by the same company at its Wharton mine, Boone County, and another 50 at Kopperston, all in West Virginia. Two towns, one named Drager and another Sunnysdale, are being constructed by the Sunnyside Improvement Co., a subsidiary of the Utah Fuel Co., in Carbon County, Utah. The work was commenced in October, and about half of the 450 houses were completed last year. In order that their men could reside nearer the mines, 40 new company houses were built also by the Red Jacket Coal Corp. at Wyoming and 10 at Mullens, all in Wyoming County, West Virginia.

At Totz, Ky., the newly organized Peerless Darby Coal Co., which purchased the holdings of the Splint Coal Corp., the operations of which were suspended, is recovering materials from the old mine in the Darby seam and opening an entirely new mine in the same seam, temporarily using the old aerial lowering tram and old tippie. Two railroad-car dumpers were installed in 1942, a 2,000-t.p.h. capacity dumper by the H. C. Frick Coke Co. at Leisenring, Fayette County, Pennsylvania, and a 1,800-t.p.h. capacity dumper by the Columbia Steel Co., at Horse Canyon, in Utah.

On May 10 of last year, the Hillman Coal & Coke Co. started construction for the reopening of the Black Diamond mine, near Monongahela City, Pa., and the plant was put

in operation Oct. 12. The mine had to be dewatered, and the headings cleaned of fallen rock. A fan, motor-generator equipment, trolley and feed lines were installed and a 175-t.p.h. rail and river tippie, a lamphouse, stable and office erected. Mine cars, locomotives, fan, generating equipment, shortwall machines, tippie, lamphouse and stable structures were all salvaged from other mines and transferred to Black Diamond.

Among other mines reopened in 1942 were the Penwell mine, Pana, Ill., with the Victory Coal Co. as operating lessee; Henry Clay mine, Lookout, Ky.; Four States mine, Annabelle, W. Va., after eleven years of idleness, now to be known as Christopher No. 6 and to be operated by Christopher Associates, Inc.; Harrison mine, Que Creek, Pennsylvania, down for eight years; Superior Mines 1 and 3, Lochvale, Pa., J. O. Clark Heirs Partnership (closed in 1936) and now operated as the Clark Coal Division; No. 3 Slope, Marvel, Ala.; Roden Coal Co.; Ruth mine, Shamrock, Pa.; Black Beauty Coal Co.; Premier mine, in Alaska, flooded in 1933 and rehabilitated in 1942 by the Anchorage Coal Co.; and a mine in South Carolina of the Carolina Coal Products, Inc.

New Properties Opened

Additional properties reopened are listed in the article beginning on p. 84. Construction of new mines, except to supply special types of coals or safeguard the coal supply of certain regions, was held down by both operators and the War Production Board. Most of these new operations are listed in the article previously referred to (p. 84). They include several slope mines opened by stripping companies, including the Truax-Traer Coal Co. and the Pyramid Coal Corp. Building up the supply of coking coal was the major objective in several construction or rehabilitation projects, such as the Horse Canyon opening and Sunnyside rehabilitation programs in Utah, the Wilkeson Products Corp. project in Washington and three new operations in Oklahoma being opened by the McAlester Fuel Co., as well as other projects in the East and South.

Following sinking of a hoisting and material slope and airshaft production began in the Short Creek (Alabama) area of the Tennessee Coal, Iron & R. R. Co.'s holdings. A shaft was sunk for Mine No. 5, south of Bruceville, Ind., for the Knox Consolidated Coal Corp. The H. C. Frick Coke Co. prepared to augment the product of the Leisenring (Fayette County,

Pennsylvania) area through its underground belt system by 10,000 tons daily and that of its Greene County area by 20,000 tons a day.

As pointed out in connection with certain operations previously mentioned, several of the new mines were opened to replace others worked out. A number also were closed in 1942, the capacity affected reaching a sizable total in some districts. New additions to the obituary list in 1942 included: Peabody No. 43 mine, Harrisburg, Ill., aged 25; Middle Fork

mine, United States Steel Corp., aged 26 and idle since July 3, 1924 (plant dismantled); and the Montevallo mine, Montevallo Coal Mining Co., Aldrich, Ala., aged 110.

At several mines, especially in Kentucky, a device known as a plastic shield was introduced to protect the eyes of workers and to serve instead of goggles. At the mine of the Freeman Coal Mining Corp., near Herrin, Ill., arrangements have been made with the Vitamins Industrial for the regular distribution of multi-vitamin

tablets to all the Freeman company's 600 miners. In the winter, these men see little of the sun except at the week-end and even then they keep indoors and the sun has little actinic strength. So the president of the company, J. Roy Browning, hopes that by this means accidents at the mine will be reduced, the health of the miners be improved and their enjoyment of life enhanced. The tablets provide not only "sunshine vitamins" (Vitamin D) but all those known to be essential for human wellbeing.

MECHANICAL CLEANING

Paces 1942 Bituminous Preparation Work

Facilities for Preparation Rise With Increased Demand for Stoker Coal—Many Mechanical Cleaners Installed in Existing Plants Last Year—Several Complete New Plants Built or Contracted For in 1942

SALES of coal-preparation equipment to bituminous mines were down in 1942 as a result of war-time curbs on materials, but there was no slackening in interest and the tonnage mechanically cleaned attained a new high. A fair number of new plants, usually with mechanical cleaning, were built or contracted for, and mechanical cleaners went into a number of existing plants. In several, particularly in the coking-coal region, special provisions for raw-coal blending were installed.

With continued interest in washing went continued interest in drying, both mechanically and by heat. Freezeproofing chemically, usually with flake or liquid calcium chloride, was the subject of added attention. The output of stoker coal and other small sizes increased and was reflected in the installation, as far as equipment could be obtained, of crushers, vibrating screens, bins, conveyors and auxiliaries for preparing and loading these smaller grades. Several mines were operated as straight crushing propositions. River-loading plants, especially in western Pennsylvania and northern West Virginia, were featured by further installations.

The War Production Board's prohibition of the use of oil in dustproofing coal was a major development of the past year. Oil, however, was permitted to be used in small quantities (less than those needed to achieve

dustlessness) in freezeproofing. Reactions to this order were various. Some companies gave up dustproofing. Others sought new products. In the Far West, the Utah Fuel Co. was one of many to adopt "Coaladd," a water-base compound of glutinated starches, dextrines, film-forming materials and calcium chloride. Extensive tests, the company reported, showed that it would do the job equally well, although its use required changes in storage, pumping and spraying equipment. Other new users included the Crummies Creek Coal Co., Harlan Fuel Co. and Mary Helen Coal Corp., in eastern Kentucky, etc.

Calcium chloride was the other most-used dustproofing medium in 1942, and found a number of new adherents. Investigation of the possibilities of vegetable-oil compounds was undertaken by Bituminous Coal Research, Inc., which continued its study of calcium chloride and dustproofing in general. Some of the new products, it is felt, show promise.

Rebuilding and improvement projects at plants included: reconstruction of a tippie by the Union Pacific Coal Co., in Wyoming; installation of screens by the Montana Coal & Iron Co., Washoe, Mont.; additions and alterations, including vibration screens, by Kelleys Creek Colliery Co. (No. 4), Ward, W. Va., and so on across the country.

The rising demand for stoker coal

was responsible for numerous changes and additions at preparation plants. Southern Illinois, for example, reported that most operations have had to increase their output of this size, along with other smaller fuels. Additional crushing equipment consequently was installed by the Bell & Zoller Coal & Mining Co. to enable it to break everything to 2 in., while the Valier Coal Co. put in a 300-ton-per-hour machine to add to its railroad-fuel output. In southern West Virginia, the Atlantic Smokeless Coal Co. and affiliates, to fill a demand for screenings, increased screen size to 1½ in. at two plants and installed a crusher at a third to permit crushing the entire output to this size. On the other hand, the Blue Diamond Coal Co., Blue Diamond, Ky., installed two McNally-Norton Type A pick breakers to reduce lump to egg and nut.

Screening or rescreening installations to improve the preparation of stoker and other small sizes included the following examples in 1942: Clover Splint Coal Co., Inc., Clo-splint, Ky., two Allis-Chalmers "Ripl-Flo" vibrators for improved stoker preparation; C. H. Mead Coal Co., East Gulf, W. Va., rescreening installation, including "Ripl-Flo" for 0x4; Gulf Mining Co., Crab Orchard, W. Va., "Aero-Vibe" screening installation. Both the latter were handled by Kanawha.

Crushers in combination with

screens, usually for stoker preparation, were common. Examples include: Rockvale No. 3 mine, Colorado Fuel & Iron Corp., Canon City, Colo., single-roll crusher, bucket elevator and 4x10-ft. vibrator; Consolidation Coal Co., McRoberts, Ky. (by Fairmont), crushing and rescreening plant; Harlan-Wallins Coal Co., Lejunior, Ky., complete new stoker-coal plant, including two Jeffrey-Traylor vibrators and 30x54 single-roll crusher to crush egg or smaller; Harlan Collieries Co., Brookside, Ky., new stoker plant, two 6x16-ft. "Aero-Vibe" screens and a Jeffrey 30x48 single-roll crusher; Mary Helen Coal Corp., Coalgood, Ky., complete revision of stoker facilities, including moving one crusher, installing a new Jeffrey 30x60 machine to crush lump and smaller, relocating existing vibrators and installing two additional 5x7-ft. Jeffrey-Traylor units; Utilities Elkhorn Coal Co., Martin (Ky.) No. 8 mine, new plant, about 150 tons per hour, for screened stoker, carbon and stove sizes consisting of Jeffrey "R" Series 36x54 stoker-coal crusher, two Robins "Elliptex" screens and the necessary conveyors for carbon, stoker, stove and oversize.

Tipples and Bins Built

In Alabama, the Alabama By-Products Corp. equipped its reopened Labuco mine with a new tippie and preparation plant, while out in Illinois the St. Louis & O'Fallon Coal Co., East St. Louis, planned an unloading conveyor with a capacity of 100 tons per hour to take five different sizes of coal from a track hopper and discharge them into separate bins for truck sales. Each bin, it was contemplated, would have a capacity of 150 tons and would be fitted with two cut-off gates permitting loading of two 15-ton trailers simultaneously. The Koppers Coal Div., Eastern Gas & Fuel Associates, built a tippie surge bin at its Federal No. 1 plant, in northern West Virginia, to eliminate delays and smooth the flow of coal to the screens.

Installations of individual cleaning units or expansion of existing plants included such items as a No. 7 "Super-Duty Diagonal-Deck" coal-washing table at Roslyn, Wash., for the Northwestern Improvement Co., treating 165 t.p.h. The University of Iowa (Coal Age, June, 1942, p. 69) carried on an experimental program showing possibilities for the production of good stoker fuel from screenings by tabling. In Illinois, the Schuyler Coal Corp., Rushville, started up a washing plant to improve the quality of its screenings and certain other sizes, using four No. 7 tables supplemented by a con-

crete settling tank for sludge (Coal Age, January, 1943, p. 62).

In Utah, the Utah Fuel Co. expanded its Link-Belt constructed plant at Castle Gate with additional washing and tippie equipment. The Old Ben Coal Corp., West Frankfort, Ill., installed a McNally-Norton automatic washer and Norton-Collins dedusting equipment, while Ohio developments

included a Jeffrey washing plant for 4x $\frac{3}{4}$ for the Midvale Coal Co., Midvale. The Ohio Coal Dept., M. A. Hanna Co., added a McNally-Norton unit for 7x1 $\frac{1}{4}$ to its Willow Grove No. 10 plant, along with a C-M-I continuous centrifugal dryer for 0x $\frac{1}{4}$. The Pincey Fork No. 1 plant of the same organization, constructed by Link-Belt, in addition to air-pulsated jigs for

New Bituminous Preparation Facilities in 1942*

Coal Company	Plant Location	Capacity, Net Tons of Feed per Hour	Preparation Equipment
Alaska R. R.	Anchorage, Alaska	25	McNally-Pittsburg ¹
Blue Diamond Coal Co.	Blue Diamond, Ky.	400	McNally-Pittsburg ²
Ames Mining Co.	Fayette, W. Va.	30	Kanawha ³
C. H. Mead Coal Co.	East Gulf, W. Va.	600	Kanawha ⁴
	East Gulf, W. Va.	500	Kanawha ⁵
	Byrne, W. Va.	400	Kanawha ⁶
	McRoberts, Ky.	250	Fairmont ⁷
Consolidation Coal Co.	Jenkins, Ky.	700	Fairmont ⁸
Crucible Fuel Co.	Crucible, Pa.	500	Roberts & Schaefer ⁹ Cent. & Mech. Ind. ⁹
Gulf Mining Co.	Crab Orchard, W. Va.	40	Kanawha ³
Guyan Eagle Coal Co.	Amherstdale, W. Va.	50	Kanawha ¹⁰
Hanna Coal Co.	Willow Grove, Ohio	385	Link-Belt ¹¹
Hillman Coal & Coke	Monongahela City, Pa.	200	McNally-Pittsburg ¹²
Hume-Sinclair Coal Mining Co.	Hume, Mo.	50	Cent. & Mech. Ind. ¹³
Johnstown Coal & Coke Co. (No. 4)	Portage, Pa.	100	Kanawha ¹⁴
Kelleys Creek Colliery Co. (No. 4)	Ward, W. Va.	200	Kanawha
Koppers Div., Eastern G. & F. Assoc.	Kopperston, W. Va.	650	McNally-Pittsburg ¹⁵
Lillybrook Coal Co.	Big Stick, W. Va.	60	Kanawha ³
Midvale Coal Co.	Affinity, W. Va.	200	Kanawha
Montana Coal & Iron Co.	Midvale, Ohio	70	Jeffrey ¹⁶
Morgan Coal Co.	Washoe, Mont.	200	Link-Belt
New River Co.	Bryant, Ill.	75	McNally-Pittsburg ¹⁷
	Mt. Hope, W. Va.	150	Roberts & Schaefer ¹⁸
	Lochgelly, W. Va.	200	Kanawha ¹⁹
	Jeffrey ¹⁹	...	Jeffrey ¹⁹
Northwestern Improvement Co.	Summerlee, W. Va.	200	Kanawha ¹⁹
	Jeffrey ¹⁹	...	Jeffrey ¹⁹
	Cranberry, W. Va.	60	Kanawha ³
	Deister Concentrator ²⁰	...	Deister Concentrator ²⁰
Old Ben Coal Corp.	Roslyn, Wash.	400	McNally-Pittsburg ²¹
Pyramid Coal Corp.	West Frankfort, Ill.	700	McNally-Pittsburg ²²
Republic Steel Corp.	Seeleyville, Ind.	700	Roberts & Schaefer ⁹ Cent. & Mech. Ind. ⁹
	Fredericktown, Pa.	700	Jeffrey ²³
	Sayreton, Ala.	60	Fairmont ²⁴
	Road Creek, Ky.	225	Cent. & Mech. Ind. ¹³
Rochester & Pittsburgh Coal Co.	Waterman, Pa.	50	Kanawha ²⁵
Semet-Solvay Co.	Harewood, W. Va.	500	McNally-Pittsburg ²⁶
Sloss-Sheffield Steel & Iron Co.	Maben, Ala.	200	Jeffrey ²⁷
Tennessee Coal, Iron & R. R. Co.	Short Creek, Ala.	225	Link-Belt
Union Collieries Co.	Renton, Pa.	300	Link-Belt ²¹
Utah Fuel Co.	Sunnyside, Utah	380	Link-Belt ²⁸
Weirton Steel Co.	Weirton, W. Va.	...	Fairmont ²⁹
West Virginia Coal & Coke Corp.	Omar, W. Va.	...	Jeffrey ³⁰
Westmoreland Mining Co.	Blairsville, Pa.	120	Kanawha
Wyatt Coal Co.	Sharon, W. Va.	100	

* Includes installations of preparation equipment in existing structures.

¹ Including crusher, McNally-Norton automatic washer for crushed 2-in., and Carpenter centrifugal dryer for minus $\frac{3}{4}$. ² Two Type A McNally-Norton pick breakers, lump to egg and nut. ³ Kanawha-Belknap chloride washing equipment. ⁴ Including washing equipment for stove and nut. ⁵ Rescreening, Allis-Chalmers "Ripl-Flo" vibrators for 0x $\frac{1}{4}$.

⁶ River-loading plant. ⁷ Crushing and screening facilities. ⁸ Complete plant, Chance cones, American air tables, etc. ⁹ Complete plants with 2,000-ton blending bins and river-loading facilities. Crucible includes hydroseparators and Hydrotators for 4x0 and two C-M-I continuous centrifugal dryers, 100 t.p.h., for $\frac{1}{4}$ x48-mesh; Republic, Jeffrey Baum jigs and Hydrotators, 7x0, and three C-M-I dryers 165 t.p.h., for $\frac{1}{4}$ x48-mesh. ¹⁰ Screening installation, Allis-Chalmers "Aero-Vibe."

¹¹ Complete plant, picking, washing, mixing, blending, including Link-Belt air-pulsated jig. ¹² McNally-Norton automatic washing equipment, 7x1 $\frac{1}{4}$. ¹³ C-M-I continuous centrifugal drying equipment. ¹⁴ Including Kanawha-Belknap chloride washer, 60 t.p.h., stove and nut. ¹⁵ Additions, tippie and washery, including Mensies cone separator, 175 t.p.h., 2 $\frac{1}{2}$ x $\frac{3}{4}$.

¹⁶ Washing plant, 4x $\frac{3}{4}$. ¹⁷ McNally-Vissac thermal dryer, 1 $\frac{1}{4}$ -in. x $\frac{1}{4}$ -mm. ¹⁸ Hydroseparator, 0x2 $\frac{1}{2}$. ¹⁹ Plants for 0x2 $\frac{1}{2}$ coal, including 90-t.p.h. Jeffrey Baum jigs, 2 $\frac{1}{2}$ x $\frac{3}{4}$. ²⁰ No. 7 "Super-Duty Diagonal-Deck" coal-washing table, 4x0.

²¹ Including McNally-Norton automatic washer and Norton-Collins dedusting equipment. ²² Five-track plant, all coal crushed to 6 in. for cleaning in McNally-Norton automatic washers; McNally-Vissac thermal dryers for 1 $\frac{1}{4}$ x0. ²³ Washery additions. ²⁴ Including headhouse for preliminary picking, 680-ft. rope-and-button conveyor and Chance cleaning plant. ²⁵ Blending plant, 0x5.

²⁶ Including McNally-Norton automatic washer for 0x1 $\frac{1}{4}$, bin and screening and loading equipment. ²⁷ Two Jeffrey Baum jigs, 150 t.p.h., 0x3; one diaphragm jig, 75 t.p.h., 0x $\frac{3}{4}$. ²⁸ Coal-sampling equipment. ²⁹ Dust-collecting equipment. ³⁰ Jeffrey diaphragm jig, $\frac{3}{4}$ x4. ³¹ Including air-pulsated-jig washing equipment.

7x1½ and 1½x0, "SS" screen-type heat dryers for 1½x¾ and ¾x1½ mm., and a C-M-I unit for 1½-mm., used a transfer table ahead of its rotary dump to mix cars from two tracks and thus blend coal from various sections of the mine (*Coal Age*, July, 1942, p. 47).

Koppers Coal Div. installed a Roberts & Schaefer pilot cleaning plant (0x¾) at Melcroft, Pa., for experimental work on coal from both Melcroft and other plants. Preparation improvements at the No. 4 mine, Johnstown Coal & Coke Co., included a Kanawha-Belknap chloride washer. The Westmoreland Mining Co., Blairsville, Pa., installed a Jeffrey diaphragm jig for ¾x4.

West Virginia installations included chloride washing units as follows: Ames Mining Co., Fayette; Gulf Mining Co., Crab Orchard, and Lillybrook Coal Co., Big Stick, stove and nut; New River Co., stove; and the Koppers Coal Div., Stotesbury No. 11, unit for reducing hand-cleaning costs.

Washer Duplicated

Additional facilities to provide for loading 6,500 tons per day were installed at Kopperston, W. Va., by Koppers. The project included speeding up the mine-run conveyors, adding to raw-coal screen area, installing additional loading and storage tracks and putting in a duplicate of the present washer (Menzie's cone separator for 2½x¾).

The C. H. Mead Coal Co., East Gulf, W. Va., installed preparation improvements including washing equipment for stove and nut, while a number of washing additions were made by the New River Co. One was a hydroseparator for 0x2½, while Summerlee and Lochgelly were equipped with Kanawha plants for preparing 0x2½, including Jeffrey diaphragm jigs for 2½x¾.

In Alabama, a Link-Belt washery addition was made by the Republic Steel Corp. at Sayreton, while the Sloss-Sheffield Steel & Iron Co., Maben, put in a McNally-Norton automatic washer for 0x1½, along with bin and screening and loading facilities.

While a number of complete new plants contracted for in 1941 went into operation, at least five additional projects were installed or contracted for in 1942. One was the Short Creek plant for the new operation of the Tennessee Coal, Iron & R.R. Co., in Alabama, including two Jeffrey Baum-type jigs for 0x3 and a Jeffrey diaphragm unit for 0x¾.

A new eastern Kentucky operation was that of the Republic Steel Corp. Here, Fairmont contracted to con-

struct a new plant including equipment for picking and crushing the coal before it is discharged into a 680-ft. rope-and-button conveyor transferring to a 300-ft. belt conveyor to the main plant. Plus 1½-in. coal will be washed in a 12-ft. Chance cone, the raw ½x0 being mixed back after dewatering. Provision is made for crushing cone reject and recirculating it.

Installations put in service in eastern Kentucky in 1942 included the Jenkins central plant of the Consolidation Coal Co., equipped with Chance cones, air tables and other facilities. Capacity is 700 tons per hour. Another was Esco No. 10, Utilities Elkhorn Coal Co. (*Coal Age*, September, 1942, p. 43). No shaker screens are employed, and cleaning equipment comprises a Link-Belt air-pulsated jig for 5x½ and a Link-Belt-American "Twin-Dex" air table for ½x0. The Elk Horn Coal Corp., Wayland, equipped with a Jeffrey Baum-type jig, solved a problem in air cleaning of fines by installing Raymond "whizzer" separators to remove minus 28-mesh dust from 1½-in. coal, which then is cleaned in Stump boxes (*Coal Age*, January, 1943, p. 49).

A complete plant, including picking, mixing and blending facilities, with washing in a Link-Belt air-pulsated jig, was contracted for by the Guyan-Eagle Coal Co., Amherstdale, W. Va., thus adding to the mechanical-cleaning capacity already installed in Logan County.

Blending bins and river-loading facilities were included in two large plants for western Pennsylvania in 1942. River-loading facilities also were incorporated in a tippie erected for the reopened Black Diamond mine of the Hillman Coal & Coke Co., near Monongahela City, Pa., while the Consolidation Coal Co. put in a river-loading plant (Kanawha) at Byrne, in northern western Virginia. A blending installation, for 0x5, was installed for the Semet-Solvay Co., Harewood, W. Va., by Kanawha.

At the two western Pennsylvania plants, blending of raw coal is accomplished in 2,000-ton bins. The Crucible Fuel Co. plant, Crucible, Pa., is equipped with hydroseparators and Hydrotators for washing ½x0, supplemented by two C-M-I continuous centrifugal dryers for ½x48 mesh. The Fredericktown plant of Republic, also Roberts & Schaefer, includes Jeffrey Baum jigs and Hydrotators for 7x0 and three C-M-I drivers for ½x48 mesh.

In Indiana, the Pyramid Coal Corp. contracted for a 5-track preparation plant largely duplicating, except for necessary changes to fit conditions, the

McNally-Pittsburg plant put in operation early in 1942 at the Flamingo mine of the Fairview Collieries Corp., Fairview, Ill. This move, made expedient by war conditions, saves time and reduces design problems. Flamingo includes a preliminary picking and breaking house, coarse- and fine-coal washers, crushing equipment and a rewash unit for middlings, and thermal dryers for minus 1½ in.

Drying Interest Grows

Interest in drying, it might be said, outran the equipment available. However, a number of installations were made, some of which have been noted briefly earlier in this review. Others included the following C-M-I-continuous centrifugal units: Hume-Sinclair Coal Mining Co., Hume, Mo., slurry, and the Rochester & Pittsburgh Coal Co., Waterman, Pa., 0x¾. Late in the year, the Morgan Coal Co., Bryant, Ill., contracted for a McNally-Vissac thermal dryer with a capacity of 75 tons per hour for 1½-in.x½-mm. coal. Drying with infra-red lamps was the subject of some experimentation in 1942, but there was a question whether the heat release of such lamps would make them commercially feasible. Dewatering on screens received continued study, with several users experimenting with screen cloth to replace plate and other mediums.

Treatment of wash water to reduce acidity showed some increase in 1942. Soda ash and lime water were among the agents used. At strip operations, there was some speculation that the alkaline effect of clays in the pit might be the reason why little trouble with corrosion had been encountered at some such operations. An increasing number of strip mines put sludge ponds back in the pits, some with and some without filter-type dams, but usually with a long route back to the clear-water pond to insure clarification.

Dust-collecting installations in 1942 included the Old Ben Coal Corp., West Frankfort, Ill., and the West Virginia Coal & Coke Corp., Omar, W. Va. In Illinois, the Bell & Zoller Coal & Mining Co. revamped the system at its Zeigler plant, installing square instead of round ducts, which are easier to repair. Also, the cyclones are placed ahead of the exhausters, protecting the blades.

Refuse disposal was the subject of additional study and installation of equipment for economy and convenience. Koppers, for example, replaced the old aerial tramway at Federal No. 1 with a new installation and overhauled slate-disposal facilities at Kopperston. Interest in hydraulic disposal

increased in 1942, with one operation reported as having a system in operation and another with the equipment on hand.

With materials scarcer, maintenance of preparation plants was tightened up. While corrosion-resisting steel was difficult to come by, more plants installed it whenever it could be obtained. To prolong the life of flumes and chutes, the Sahara Coal Co., in

southern Illinois, paved them with brick or concrete. Such paving was found to last fairly well.

Gunitite was used for repairing tanks and chutes at the Isabella (Pa.) mine of the Weirton Coal Co. (*Coal Age*, October, 1942, p. 134). The operation consists of scraping clean the surface to be covered and spot-welding to it wire-mesh reinforcement (No. 8 wire, 4-in. square mesh). After form-

ing and spotting, the wire mesh is pulled out from the steel as far as possible between welds. Then the gunitite is applied in three successive layers to a thickness of approximately 2½ in., using the regular guniting machine and crew from the mine. With quick-setting cement, the equipment can be put back in service within a few hours after completion. A substantial cost saving and good wear are reported.

MAJOR GAINS

Mark Power and Maintenance in 1942

More A.C. and D.C. Substations Added—Distribution Tightened for Higher Efficiency and Copper Savings—Battery Use Grows—Shops and Maintenance Methods Show Marked Improvements in Last Year

MANY of the war limitations of the last year affecting installations of electrical and mechanical equipment and maintenance methods have proved to be money savers and will stay on in the future. Thanks to a wise administration of coal-mine priorities, 1942 was a year of progress in installation of new machinery together with better power-distribution facilities, all of which added to the present and potential efficiency of the industry and put it in a better position to meet the demands of higher production with declining manpower.

Purchased electric power maintained its status of predominance but at least one new generating plant was put into use, this by the Pyramid Coal Corp. in the Middle West. In one coal field where installation of underground loading and conveying machinery focused attention on outages of purchased power, the coal operators stirred the power company to start revamping its lines, switching and substation facilities.

Coal companies installed numerous d.c. substations. The country was scoured for used conversion apparatus and many new ones purchased or ordered, some of these orders without promises of delivery sooner than 18 to 20 months. Mercury rectifiers, having thoroughly proved their efficiency and adaptability to mining, found continued preference, but operators were glad to take converters or motor generators on promise of earlier delivery. For some years single-anode rectifiers

have dominated the tank or multiple-anode type and now the sealed-tube single-anode type has piled up many months of trouble-free operation, which apparently foretells their future dominance over the more complicated pumped type. About twenty coal companies now own rectifiers and some have as many as three or four units. Those making installations in 1942 included: Colorado Fuel & Iron Corp., Frederick mine, Colorado, one 300-kw. portable; Utah Fuel Co., in connection with rehabilitating and enlarging three mines at Sunnyside, Utah, three m.g. sets and one ignitron rectifier for 550-volt haulage power.

In the new d.c. substations most of the conversion units are 300-kw. capacity, but a number of smaller units were put in operation, including a 150-kw. unit at No. 4 mine, Crystal Block Coal & Coke Co., Logan County, W. Va. (rotary converter), and Esco No. 10, Utilities Elkhorn Coal Co., Esco, Ky. Making them portable gained impetus and this included old motor generators as large as 500 kw. Changed mining conditions resulting from driving into uncharted natural difficulties or a necessary switch of mine development to more favorable areas that had been held in reserve forced the moving of many substations sooner than expected and that called attention to the advantages of portables. Copper shortage played the same role. Local distributors made available a few years ago to get the most out of existing units

without interruptions worked conveniently into this accelerated trend for power improvement.

In the control of d.c. substations there came to light data on a recent installation (Sterling Coal Co., Baker-ton, Pa.) in which the generator voltage is automatically lowered for a short period to start equipment after the circuit breaker has been out. The special automatic reclosing circuit breakers for the job, which operate on any d.c. voltage from 150 to 300, were built by I-T-E, which also builds the load distributors previously mentioned.

Numerous transformers were installed to augment the existing capacity of a.c. substations and also in connection with the construction of substations for new underground developments, for complete new surface plants and for tipples of World War I vintage, some of which were converted from d.c. to a.c. drives. To cite a few typical examples of large installations: the Locust Coal Co., in the anthracite field, installed three 500-kva. units (66,000/11,000 volts) to improve delivered voltage and the Valier Coal Co., Illinois, put in three 667-kva. transformers (33,000 to 2,300 volts) to replace smaller transformers. For its new Jenkins (Ky.) central preparation plant the Consolidation Coal Co. built two new a.c. substations, one consisting of three 667-kva. transformers reducing from 42,000 to 2,400 volts and the other of three 333-kva. transformers making a second step-

down to 220 volts. In connection with its Sunnyside program, previously mentioned, the Utah Fuel Co. constructed a substation comprising three 1,000-kva. 44,000/4,000-volt transformers and installed transformers in converted mine cars (*Coal Age*, September, 1942, p. 52) to bring the 220-volt working power as close to the point of use as possible and permit quick relocation. Additions at the Kebler No. 2 mine, Colorado Fuel & Iron Corp., included three 75-kva. transformers and 3,000 ft. of 2,200-volt underground feeder cable.

Increased loads, the necessity for reducing current to save copper and the war call that motors of the smallest practicable sizes be used gave capacitors another boost. Two outstanding examples are supplied by eastern Kentucky. The secondary transformer substation at the Jenkins plant includes fourteen 45-kva. 220-volt General Electric capacitors. These are installed beside the transformers and within 40 ft. of the plant.

Capacitors Added

Adding air tables at the Wayland plant of the Elkhorn Coal Corp. overloaded the existing 600-kva. transformer bank to 700 kva., but instead of purchasing larger transformers an order was placed for 360 kva. of 220-volt capacitors for installation in the two control rooms of the plant. This will raise power factor sufficient to reduce the kilovolt-ampere load to 600.

For underground a.c. substations there was the same trend to portability as with the d.c. units and transformers with non-inflammable cooling liquid continued in favor as a means of decreasing the underground fire hazard. In Indiana, for instance, the Knox Consolidated Coal Corp. installed several at its Bicknell mines and Walter Bledsoe & Co. ordered some for the Dresser mine.

Gains in mechanical mining during the last few years brought electrical distribution into the limelight but it took the copper and rubber priorities of 1942 to focus sharp attention on this activity. Portable cables, instead of suffering abuse, are on the whole being treated with utmost respect.

Vulcanizing of cables became widespread and where deliveries on factory-made vulcanizers were too slow the units were made in the mining companies' shops. Good pieces of cable as short as 2 ft. now are being spliced to restore damaged cables to proper lengths. Braid-covered trailing cables, which began their exit just after World War I, have staged a comeback and in the improved woven-loom type are giving good service.

Saving the cost and materials of all insulation was tried on shaft feeders by at least one company. A 4,000-volt line installed in an airshaft consists of bare copper wires with a wide spacing, but as yet that coal company has not had sufficient experience with the method to justify releasing any details.

In the realm of rail bonding, certain manufacturers took the unusual step of suggesting that 2/0 bonds might well be used in many cases instead of 4/0, thus effecting a considerable saving in copper. This presupposes that bonding will be kept in the very best of condition so that full advantage can be taken of the rails as conductors. While types of bonds and methods of application showed no striking development, one manufacturer (Ohio Brass) perfected a 60-lb. drill which it is asserted will drill holes for wedge-type bonds in 40 seconds.

Equipment in working sections, especially for conveyor mining, was augmented in many mines by installations of distribution boxes, this so one room cable can serve the drill, cutter, loader or face conveyor. Besides the marked reduction in total feet of cable required per room the boxes have the advantages of reducing both the labor of handling cables and the physical hazards.

In the field of electrical developments, several that will likely find applications in mining were announced and electronic control was put to a new and important use in strip mining: namely, as the heart of an automatic leveling device on a 35-yd. strip shovel. Its quick action after each move materially increases digging time (*Coal Age*, November, 1942, p. 56).

General Electric's amplidyne control, first applied experimentally to a mine hoist and a shovel two years ago, was installed on a Marion 35-yd. Ward Leonard controlled shovel of the Midland Electric Coal Corp., Farmington, Ill. With this arrangement the main generator has but one field (separately excited). Thus, as compared to the old standard equipment, two fields (differential-series and self-excited) were eliminated. Smooth acceleration, high output and low maintenance are the advantages claimed for this new control.

For about the same duty in connection with Ward Leonard controls on strip shovels and hoists Westinghouse has developed "Rototrol," in which the regulating armature is connected in the galvanometer position of a Wheatstone bridge circuit where the generator fields and resistances form the legs. The Bucyrus-Erie 1050-B shovel with 33-cu.yd. dipper at the new Flamingo mine of the Fairview

Collieries Corp., Fairview, Ill., is equipped with "Rototrol" for the swing, as well as with automatic leveling controlled by mercury switches. Like several other shovels in late years, the dipper is equipped with heating units for cold-weather operation, and heating of the dipper handle is under consideration.

For motors up to 5 hp., General Electric announced "Thymotrol," an electronic method to effect stepless speed control of d.c. motors from a.c. lines. Motors of this type are applicable to coal feeders in preparation plants requiring accurate control.

Even mine cars were "electrified" during the year. The Sanford-Day Iron Works completed development of an electric unlatching device for drop-bottom car doors to displace the protruding latch levers. Ed Duncan, mine electrician, Blue Diamond Coal Co., Blue Diamond, Ky., originated the method, built it into two or three cars which were tried in service and in 1940 won a gadget contest prize with a model exhibited at Bluefield, W. Va.

That full automatic sequence control for large preparation plants has not become a thing of the past, as some might have interpreted from a number of installations of manual position sequence of a few years ago, was indicated by the automatic-sequence method in the new super-preparation plant of the Consolidation Coal Co. put into use last fall at Jenkins, Ky. Eighty-one of the plant's 128 motors (2,136 connected-horsepower) start in automatic sequence.

Permissible Equipment Up

New underground equipment purchased in 1942 indicated an accelerated trend to permissible and explosion-tested types. Federal inspection of mines plus easier money are credited with hastening the future day when only this safer type of electrical machinery will be purchased for underground use. Operators are learning, too, that with the modern well-built contact equipment the permissible inclosures have advantages in preventing tampering and keeping out dirt.

Four special cable-reel locomotives installed by the Weirton Coal Co., Isabella, Pa., were noteworthy because, at the time of their installation, they were the largest explosion-tested cable-reel locomotives ever put in a mine. They have two 50-hp. motors each, weigh over 12 tons, have hydraulic brakes and sanders, are equipped with controllers without separate reverse levers and are fitted with ventilating and cooling arrangements including fans blowing through laby-

rinths to keep the resistances, controllers and motors cooled or ventilated. These locomotives were especially designed for swing or relay service where the previous 10-ton cable-reel machines proved too small for best operation, although satisfactory for gathering.

Certain very gaseous mines in which cutting and haulage has been powered for years by storage batteries are cautiously installing mobile loaders and likewise these are battery-operated. This involves, for the first time as a prime consideration, the power required by a loading machine. Obtaining a mobile battery of sufficient capacity is proving a difficult problem. One plan of power connection in use consists of a two-conductor cable 100 ft. or more in length permanently connecting the loader and battery truck so that during loading the latter can be parked in a breakthrough or other convenient siding.

Larger Batteries Used

Larger batteries also appeared in demand for shuttle cars. For one reason, longer hauls are being attempted. Batteries are 48-cell and the trend is to install 17-plate cells instead of 15-plate. Cable-reel shuttle cars, which of late had been crowding the battery type, got set back somewhat by the shortage of trailing cable.

Glass-insulated coils for winding motors on underground machinery appear to have continued to increase, especially at mines of the larger companies. When the motor-generator set of the skip hoist at New Orient mine (Illinois) was rebuilt, joints were brazed instead of soldered and wedges of Micarta installed in place of the wooden wedges which shrunk and loosened coils.

While the outstanding mechanical progress of the year appeared in maintenance methods, there were several new developments and applications in new equipment. Late in the year the new "Goodyear steel cable V-belt" was announced. This V-belt with embedded endless steel cables is claimed to have a life up to seven times longer than cotton-cord belts and less than $\frac{1}{2}$ of 1 percent stretch.

To prevent chain breakage and generally reduce shock to cars and drive equipment, the Consolidation Coal Co. at its new plant installed hydraulic couplings (made by American Blower Co.) between the motors and reduction gears on car-haul equipment. For mine cars, Sanford-Day announced demountable Timken-bearing wheels in which the bearing can be adjusted on the axle with the wheel off.

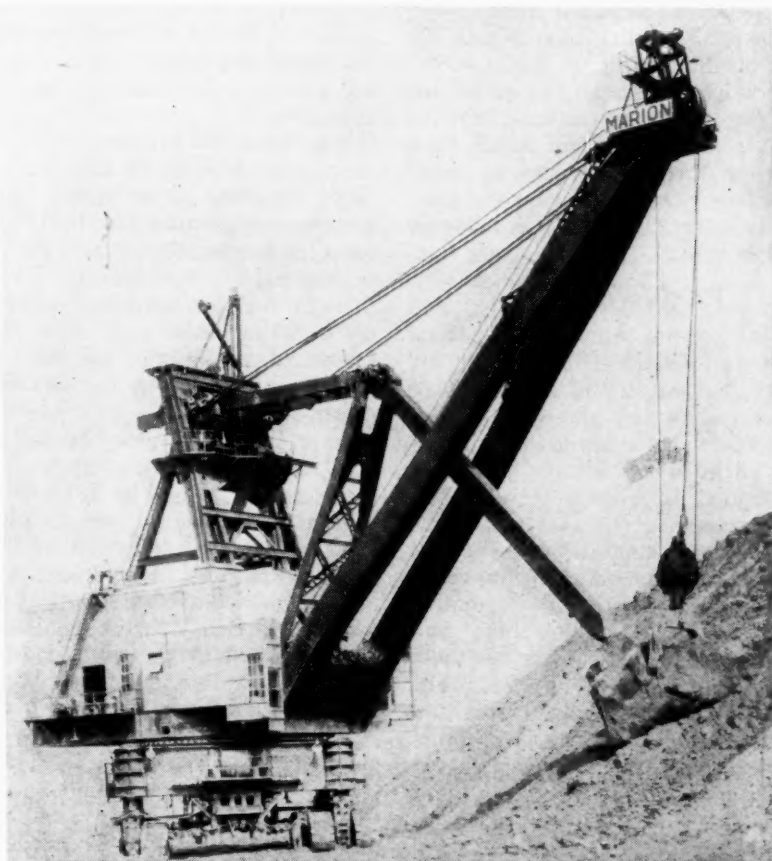
Several substitute or changed materials made their appearances. The Jeffrey company put plastic instead of aluminum blades on fans. In certain United States Steel Corp. mines, low-carbon steel rails are used in rooms and cutovers, thus allowing their being bent many times without fractures. Use of brick, tile or gunite for paving or lining chutes, flumes, tanks, etc., in preparation plants is proving successful as a steel-saving measure in both the bituminous and anthracite industries. Shortage of rubber apparently has arrested further progress in the use of thick-walled soft rubber pipe for boreholes. The first of that type was a 90-ft. continuous length of 4-in. pipe (outside diameter, 6 in.) which the Hudson Coal Co. installed in 1939 in a borehole used for flushing waste materials into a mine.

Cutting-machine bit sharpening drew attention by reason of the excellent service that can be secured from standard bits of high-grade steel when properly hardened and tempered instead of rough quench hardening. In Illinois, the Sullivan Machinery Co. installed several bit-treating plants and in them uses electric heaters to secure the necessary close control of temperature.

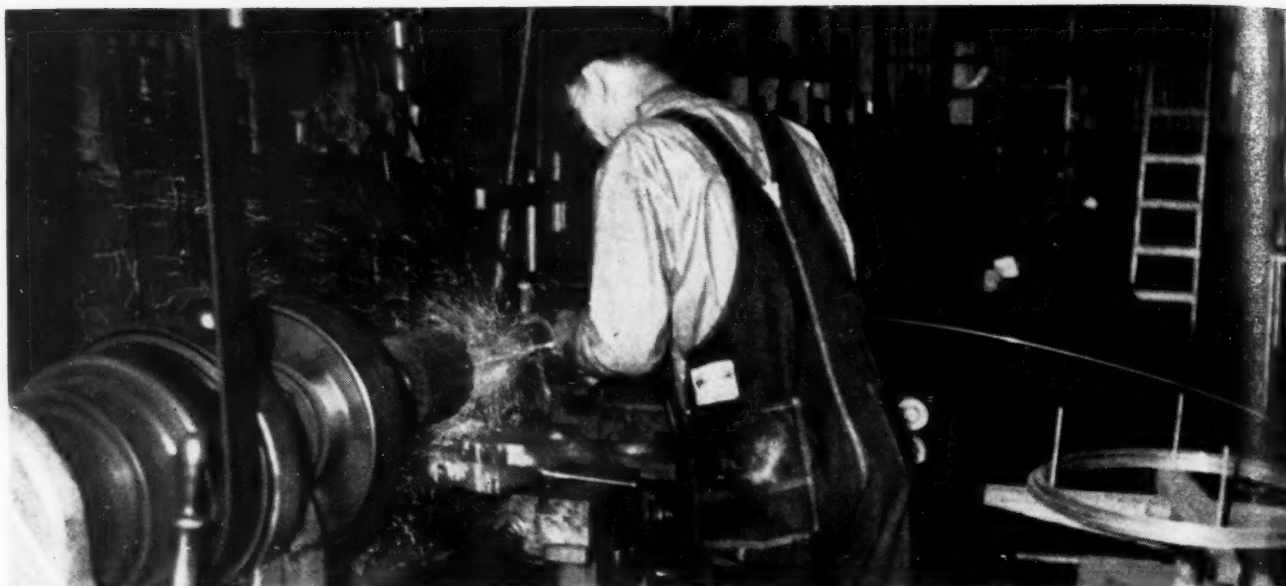
Locomotive tire and wheel filling by

arc welding made gains but not without some losses. A few operators reported that it was actually easier to get deliveries on new tires than on welding electrodes. Increased cost of having tires filled by shipping them to commercial shops caused some mines to abandon filling. In Harlan County, Kentucky, where, for a long time, tire welding had been out of vogue, at least three large mines now are filling tires. At this time, scattered data indicate that over 50 percent of the country's mine-locomotive-hauled tonnage is moved by locomotives equipped with filled tires (Coal Age, October, 1942, p. 99).

In the general field of arc welding, improvements were made in a.c. welding but the applications hardly had time to appear at the mines. The improvement was not so much in the transformer welder itself as in the electrodes. A new electrode was developed by which a skilled welder using an a.c. arc can make vertical and overhead welds which will pass the "E-6011" specification of the National Welding Society. Advantages of a.c. welding are absence of arc blow, which is a serious difficulty in d.c. welding, at least a 40 percent lower power requirement and the light weight and low cost of the unit.



New controls and automatic shovel levelling are numbered among electrical developments in strip mining in 1942.



Metallizing, a new maintenance tool for coal mines, makes rapid strides in 1942.

Many coal companies installed metallizers in central shops to build up worn parts which are difficult or impossible to repair with arc or gas welding because of the high heats and consequent warpage. The metallizer sprays the coating on without heat damage. For anchorage of the deposited material practically all users prepare the surface by turning onto it a special thread, then running over it a special knurling tool to flare the tops of the threads.

Shortage of shipping tanks for gas brought about an increase in the number of mine shops which have their own acetylene-generating units. Some have portables but for the most part generators are being installed in small fireproof buildings separate from the shops. Those companies with metallizing machines, however, find that the pressure from a shop generator is not sufficient for effective use of the metallizer and so must use bottled gas for that new duty. Shortage of the bottles limited the use of some of the metallizers.

Increased difficulty in getting additional equipment focused greater attention on making use of what was on hand and consequently on better salvage and repair and rebuilding methods. As a result, shops and maintenance methods were the subject of increasing study in 1942. For instance, the Westmoreland Coal Co., operating in Pennsylvania, reported that "our endeavor has been to assert all of our efforts in the direction of production with the equipment we had at the beginning of the year. We, like others, are making every effort not to purchase machinery and parts but to get along as best we can

with what we have. This, in many instances, has entailed ingenious remodeling and rebuilding of our machine shops."

Along the same line, the Stonega Coke & Coal Co., operating in Virginia, stated that, "due to the difficulty in getting new machinery and parts, coupled with our desire not to use any more critical materials than necessary, a salvage and repair program was carried out that resulted in our being able to use a lot of machinery and parts that formerly had been discarded."

The trend toward building of new shops and enlarging or improving existing facilities, which stands out as a maintenance milestone in 1942, is expected to prove of lasting benefit to coal mining. The industry-old gap between the increased use of machinery and the facilities to maintain it at maximum efficiency has been narrowed considerably by the war emergency.

Improved shops were in evidence both above and below ground. A complete list would be a long one. Typical are the following: Sentry Coal Mining Co., at its western Kentucky strip mine, a combined shop and supply room of fire-resisting materials; Old Ben Coal Corp., Illinois, new shop of buff glazed-tile construction, and the Pursglove Coal Mining Co., northern West Virginia, a two-story shop built from steel of a dismantled tippie (Coal Age, July, 1942, p. 54). Typical of the underground shops are the following: Dresser mine, Walter Bledsoe & Co., Indiana, a new shop 2 miles from the main shaft and near a new airshaft, and the Consolidation Coal Co., No. 93 mine,

Jordan, W. Va., a new shop $3\frac{1}{2}$ miles from the haulage portal and close to the bottom of an airshaft (Coal Age, April, 1942, p. 85).

WPB permission, the St. Louis & O'Fallon Coal Co., of Illinois, reports, made it possible to construct a new concrete and brick generator room adjacent to the big-car transfer station (see article starting on p. 91). The m.g. sets will be on the main aircourse, with current supplied from a borehole to the surface. "This change will release a mile of mine track and heavy copper conductors for face advances.

"The shop will be equipped with overhead cranes and pits. It also will serve for car inspection, lubrication and adjustments of Timken bearings. For this purpose an auto-hydraulic jack has been purchased to hoist cars to a working height to enable ready adjustment of bearings and replacement and tightening of all drawbars and body bolts. The lift will be on the car sills (leaving wheels free to turn) and an unbroken rail. Cars will be stenciled with date of lubrication. A spray gun has been installed to paint all face equipment. A vulcanizer has been installed to maintain and reclaim cable."

Another evidence of the higher respect for maintenance is the increased number of good offices for the man in charge of equipment upkeep. By title the job may be maintenance foreman, chief electrician, master mechanic or variations. These new offices fill the requirements of close proximity to the job, reasonable freedom from noise, cleanliness and convenient desks, chairs, filing cabinets and, in some cases, clothes lockers.

Illustrative of these are the partitioned offices in the shops of the United Electric Coal Cos. (Fidelity mine), in Illinois, and the South-East Coal Co., Seco, in eastern Kentucky.

In addition to the metallizer a new wrinkle in shop equipment to make its appearance is the high-pressure steam cleaner. On many maintenance jobs the work is half done when the accumulation of grease and dirt is thoroughly cleaned from the machine or unit. These steam machines made rapid gains at strip mines in the Middle West, as well as elsewhere.

"Home-made" tools, such as presses, vulcanizers for cables and belts, hydraulic jacks, machine-tool drives made from automobile transmissions and special jigs for all type of welding, were added to the equipment at many shops. A report from the strip-mining territory tells of the Enos Coal Mining Co., Indiana, using liquid oxygen to cool crankpins so they can be inserted to become, upon natural heating to atmospheric temperature, "expand" fits in locomotive drive wheels. The liquid oxygen is available because it is one ingredient of

the liquid-oxygen explosive prepared on the property for use in breaking overburden.

Lubrication practices were improved mainly by making up and following simplified charts of a minimum number of grades of lubricants to handle a job, plus following schedules of systematic application. The same trend toward standardization and systematic procedure was evident in the whole field of maintenance, bringing it a step closer to the goal expressed by the now common term, "preventive maintenance."

FATALITY RISE

Marks Safety Developments in 1942*

Loss of Life Rises 17 Percent Against 12½ Percent Gain in Output—
Explosion Fatalities Up Markedly—Rate for Roof Falls Little Changed
—Haulage Rate Up—Others Relatively Little Changed or Down

By WILLIAM W. ADAMS

Supervising Statistician
U. S. Bureau of Mines

TENTATIVE reports for eleven months and an estimate for December place the total number of fatalities at coal mines in the United States during 1942 at 1,482. Should final reports from mine operators confirm this figure, the record for 1942 will reveal an increase of 217 (or 17 percent) over the 1,265 lives lost from accidents in coal mines during 1941. Production of coal increased 12½ percent, or from an output of about 565 million tons in 1941 to an estimated output of nearly 636 million tons in 1942. The death rate per million tons of coal produced in 1942 now appears to have been 2.33, compared with 2.24 for 1941. Hence, from a safety point of view, the year just closed does not appear as favorable as 1941.

Bituminous mines throughout the country and anthracite mines in Pennsylvania both shared the responsibility for the increase in the fatality rate for 1942. Specifically, the bituminous rate increased from 2.10 in 1941 to 2.17 in 1942, and the anthracite rate rose from 3.59 to 3.95 per million

tons. The rates are based upon tonnage because man-hour data are not yet available.

Explosions—The record for 1942 was marred by six major disasters. All were explosions, and they caused the deaths of 127 men. Only 73 men were killed by major disasters in 1941, although such disasters were eight in number, two more than in 1942. Seven of the eight disasters during 1941 were explosions; one was an explosives accident in a strip mine in Illinois. The death rate from major disasters in 1942 was 0.20 per million tons, considerably higher than the rate of 0.13 from the eight major disasters in 1941. The increase in the major-disaster rate was largely responsible for the increase of the over-all fatality rate in 1942 over 1941.

The major-disaster record of 1942 started early in the year, when an explosion on Jan. 27 in the Wadge mine, Routt County, Colorado, killed 34 men. Thereafter, the coal-mining industry of the United States remained free of major disasters for 103 days. An explosion on May 11 in the Peerless mine, Sebastian County, Arkansas, killed six men. The following day (May 12) an explosion in the Christopher No. 3 mine in Monongalia County, West Virginia, resulted in the loss of 56 lives. Six days later (May 18) the industry suffered another disaster, an explosion in which

five lives were lost in the Hitchman mine, Marshall County, West Virginia. Thus the one month of May was marked by three major explosions with a loss of 67 lives.

Fifty-one days followed without an accident in which five or more lives were lost. The record was broken by an explosion on July 9 in No. 2 mine near Pursglove, Monongalia County, West Virginia, in which 20 men lost their lives. The longest disaster-free record of the year then followed—a period of 143 days. Then, on Nov. 30, an explosion killed six men in No. 10 mine near Providence, Webster County, Ky. Thus the major-disaster record of 1942 showed a total of 127 deaths from six separate accidents, 81 in West Virginia, 34 in Colorado, and six each in Arkansas and Kentucky.

Local or non-major explosions of gas or coal dust during 1942 caused 25 deaths, according to present reports. The death rate per million tons, based upon this figure, is 0.039, indicating an improvement when compared with the rate of 0.057 for 1941.

Falls of Roof and Coal—Preliminary figures for 1942 place the number of fatalities from falls of roof and coal at 762 out of a total of 1,482 fatalities from all causes combined. The death rate from this cause was 1.20 per million tons, compared with 1.19 for 1941. The rate of 1.20 for

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1942, though showing no improvement when compared with that of the previous year, need not be discouraging when thought is given to rates of 1.74 ten years ago, 1.90 twenty years ago, and 2.22 thirty years ago.

Haulage—From present data, 293 fatal accidents occurred in underground mine haulage. The death rate per million tons was 0.461, compared with 0.386 in the preceding year. Many of these accidents doubtless were due, as in previous years, to men jumping on or off cars while the trip was moving and in consequence being struck or run over or squeezed between cars or between cars and rib or timber. Accidents while cars were being coupled also usually are numerous in reports of fatalities charged generally to haulage equipment. The death rate of 0.461 for 1942 may be compared with a similar rate of 0.498 ten years ago, 0.715 twenty years ago, and 0.694 thirty years ago. Over this period the quantity of coal handled has increased from 3.29 tons per man-day in 1912 to 3.92 in 1922 and to 4.57 in 1932. No figure is available for 1942, but it probably was not less than 4.83 in 1940 and 4.90 (estimated) in 1941.

Explosives—Coal mines used about 175 million pounds of explosives in 1942. Nearly half of this was permissible explosives of various brands that had passed the "permissibility" tests of the Bureau of Mines. About one-fourth was high explosives other than "permissibles." Nearly three-tenths were of the black powder type, either pellet or granular, in the ratio of about 3 to 2 by weight. As the output of coal during the year is estimated at about 636 million tons, the



William W. Adams

consumption of 175 million pounds of explosives indicates a ratio of 3.60 tons of coal production to each pound of explosives. Similar records for 1941 showed a ratio of 3.49 tons of coal mined for each pound of explosives. With so large a quantity of explosives used in the mines, it is apparent that explosives should be numbered among the causes of accidents to the employees. According to information now available, it is estimated that 33 fatal accidents were caused by explosives during 1942. If this figure should be confirmed by final reports, the fatality rate will stand at 0.052 per million tons of coal produced, compared with a rate of 0.062 for the previous year.

Electricity—Fifty-seven men were killed by accidents directly chargeable to electric current. This number does not include fatalities, if any, from ex-

plosions that were ignited by an electric arc. The fatality rate per million tons was 0.089, slightly higher than the previous year's rate of 0.083. A normal ratio of about 18 non-fatal injuries per fatality would suggest that non-fatal injuries numbered approximately 1,025. The fatality rate (0.089 for 1942) is considerably more favorable than corresponding rates of 0.131 ten years ago, 0.155 twenty years ago, and 0.150 thirty years ago. In view of the increasing use of electric current as a source of power, this record is encouraging.

Machinery—Increasing mechanization of coal mining to permit larger output per unit of manpower has not been accompanied by an increase in fatal accidents in proportion to increasing productivity. The fatality rate per million tons of coal produced in 1942, according to present information, was 0.074. Comparable figures for earlier years extend back to 1930 when the rate was 0.086. In 1935 the rate was 0.082 and in 1940 it was 0.082. The rate for 1941 was 0.069.

Miscellaneous Causes—The six classes of accidents to which reference has been made—falls of roof and coal, haulage, explosions, explosives, electricity, and machinery—usually represent 85 to 90 percent of the total number of coal-mine fatalities from all causes. In 1942 the percentage was higher than in some other years because of the occurrence of 127 fatalities from major disasters.

Some Fatalities Down

Various other classes of mine accidents—those chargeable to falling of persons or objects, shaft accidents, open-pit accidents, and surface accidents—included 138 fatalities in 1942. The combined rate for these classes was 0.217 per million tons of coal produced. The previous year's rate was 0.276. Hence the coal industry's experience from these miscellaneous hazards was comparatively favorable in 1942.

Non-Fatal Injuries—In the absence of reports, only a rough approximation of the number of non-fatal lost-time injuries at coal mines in 1942 can be given. Assuming that no material change occurred in the usual ratio of non-fatal injuries to fatalities, it is estimated that about 70,200 non-fatal injuries occurred. Of this number, 52,900 injuries occurred at bituminous mines throughout the country and 17,300 at anthracite mines in Pennsylvania. Final figures for the previous year (1941) showed 16,828 non-fatal injuries at Pennsylvania anthracite mines, and tentative figures for that year showed 47,500 non-fatal

NUMBER OF COAL-MINE FATALITIES IN THE UNITED STATES DURING 1942*

Cause	Bituminous		Anthracite		Total	
	Number of Fatalities	Rate Per Million Tons of Coal Mined	Number of Fatalities	Rate Per Million Tons of Coal Mined	Number of Fatalities	Rate Per Million Tons of Coal Mined
Underground:						
Falls of roof and coal.....	626	1.083	136	2.358	762	1.198
Haulage.....	256	.443	37	.641	293	.461
Explosion: Major.....	127	.220	...	...	127	.200
Local.....	17	.029	8	.139	25	.039
Explosives.....	20	.034	13	.225	33	.052
Electricity.....	52	.090	5	.087	57	.089
Machinery.....	46	.079	1	.017	47	.074
Miscellaneous.....	34	.059	11	.191	45	.071
Total underground.....	1,178	2.037	211	3.658	1,389	2.184
Shaft.....	5	.009	2	.034	7	.011
Open-Pit.....	21	.036	5	.087	26	.041
Surface.....	50	.087	10	.173	60	.094
Grand total, 1942.....	1,254	2.169	228	3.952	1,482	2.330
Grand total, previous year.....	1,071	2.095	194	3.585	1,265	2.237
Production, tons (est.).....	578,269,000		57,687,000		635,956,000	
Production previous year, tons.....	511,290,000		54,115,000		565,405,000	

*Estimate from tentative reports for January to November.

injuries at bituminous mines in all States.

Standard Accident-Report Form—Through the cooperation of States representing about 85 percent of the total yearly production of coal in the United States, a simplified and standard accident-report form has been agreed upon to reduce the amount of work required in filling out accident reports for the State and Federal Governments. The standard form has

been prepared and distributed for use to all mine operators. On the face of the blank, companies will report information regarding the causes of accidents. At a single writing copies may be made for the State mining departments, State compensation or industrial commissions, and the Federal Bureau of Mines. One copy will be sent to the Bureau of Mines at Washington, D. C. To permit insertion of the "return-to-duty" date and

thereby make a supplementary report unnecessary, these forms may be accumulated and mailed to Washington at the end of each month. Copies may be mailed to the State mine inspector or commissioner as required by State law. Special information required by the State will be written on the reverse side (back) of the form. This need not be reported to the Federal Bureau of Mines, as it has no comparable factor in other States.

FEDERAL INSPECTION Starts to Move in Promoting Safety

886 Operations Examined — 8,600 Dust Samples and 8,000 Air Specimens Analyzed — Many Recommendations Adopted by Producers — Possible Initiations of Explosions Reduced — Roof, Fire and Shock Hazards Lessened

By **DR. R. R. SAYERS**

Director, U. S. Bureau of Mines

A TOTAL of 886 coal mines in 20 states, employing approximately 258,000 men and producing over 280,000,000 tons of coal annually, were visited by Bureau of Mines representatives during field operations under the Federal Coal Mine Inspection Act in its first year ended Dec. 1, 1942. The mines represent about 48 percent of the men estimated to have been working in mines of the United States in 1941 and more than 42 percent of the total coal production of the country.

This was accomplished despite the fact that the full force of federal inspectors was not on duty until August, 1942. The first group of inspectors began actual inspections in January, the second and third groups reported for duty in February and March, and the final group of the 107 inspectors went to work in August. Each group received an intensive "refresher" course at the Pittsburgh (Pa.) Central Experiment Station of the Bureau and spent a week inspecting mines under the supervision of experienced Bureau engineers.

For each of the 886 mines examined the federal inspectors posted a preliminary report giving general information regarding the mine and call-

ing attention to practices and conditions that needed immediate correction. During and after each inspection, operating officials were consulted on many phases of the investigation.

The detailed written report, embodying the inspectors' observations and recommendations, then was prepared and submitted for review in the Bureau's district office and in the College Park (Md.) and Washington (D. C.) offices. Final copies were transmitted to the management, to national and district officials of the mines workers' organizations, and to State mining authorities. Within a few days after the report was transmitted, a press release was prepared by the Bureau and distributed to a limited number of newspapers in the county where the mine was inspected and to other interested parties.

Although the Federal Coal Mine Inspection Act was passed several months before this country entered the war and thus was not a wartime measure, its importance has increased correspondingly with the growing dependence on the production of coal to keep vital industries operating at top speed and the need for the conservation of manpower. More coal is being mined for our fight against the Axis and it is being achieved thus far with only a slight increase (possibly 2 to 3 percent) in the fatality rate over 1940, which was the best year in the history of the United States mining industry

as far as accidents were concerned. In 1942 to date, the number of fatal accidents in industry as a whole has risen about 20 percent.

In addition to inspecting coal mines the federal inspectors are aiding the war program in other important fields, including the scrap-metal-salvage campaign, protection of vital mineral production facilities from sabotage and other subversive activities, and the administration of the wartime Federal Explosives Act.

The mine inspectors have access to the well-equipped coal, gas, electrical and health laboratories of the Bureau at Pittsburgh, the Experimental Mine and explosives testing station at Bruce-ton, Pa.; the accident statistics offices of the Bureau at Washington, the field supervising engineers of the Bureau, and a field staff of five mining-electrical and two mining-explosives engineers. In the laboratories, 8,600 dust samples collected by the inspectors have been analyzed to determine the combustible and explosive properties, and over 8,000 specimens of mine air have been analyzed for oxygen deficiencies and the presence of explosive or harmful gases. The inspectors have been provided with the most modern inspection equipment.

In their work, the inspectors are guided by a comprehensive inspection outline and several hundred tentative mine safety standards drawn up by

a committee of Bureau engineers. Based on Bureau of Mines safety decisions, State and federal laws, and Bureau of Mines and mining company experience over the years, these standards are subject to revision from time to time. Thoroughness is insisted upon in the inspections, and commendable practices as well as hazardous practices are noted. The Bureau of Mines men are expected to be courteous, honest and fair in their inspections. Hard work and long hours go with thorough inspections and the writing of the reports.

The federal coal-mine inspectors were selected from a list of about 2,000 applicants who had passed the Civil Service examination and they are men fresh from operating and engineering departments of coal companies. Some have been State mine inspectors and all have had five years or more of underground experience. As underground operating officials, many of them have been securing daily compliance with State mine safety laws or orders and company safety rules, as well as guiding efficient coal production. Those who have worked in engineering positions have been concerned with mine layouts and with the selection and installations of equipment. In short, the new inspectors have been accustomed to daily scrutiny and study of mine conditions, practices and equipment in their relations to safe and efficient mine operation.

Provisions of the Act

The Federal Coal Mine Inspection Act gives authorized representatives of the Bureau of Mines the right to enter coal mines to make inspections or investigations relating to health and safety conditions and the causes of accidents, with the written results to be made available for public inspection. The act provides no power of enforcement for the Bureau, and the carrying out of recommendations is through the cooperation of operator, State inspector and miner and through the power of public opinion.

The response of labor and management to the coal-mine inspection program has been gratifying. Numerous letters have been received from operators describing the safety measures effected as a result of federal inspections. Commendatory letters have been received from operators and representatives of miners' organizations, and there has been considerable constructive criticism which will enable the Bureau of Mines to carry on its inspection work more efficiently. State coal-mine inspection departments have given the Bureau excellent coopera-

tion, and the Bureau is trying to assist the State inspection departments in every way possible.

In all inspections, the Bureau endeavors to give detailed attention to explosion and catastrophe hazards. Mine explosions and fires claimed many lives in 1942. Between Jan. 1 and Dec. 1 there were twelve explosions costing the lives of 143 men. Six of these are termed major disasters because five or more men lost their lives in each. Five lives were lost in three mine fires. On the other hand, explosions and other disasters were prevented in numerous cases by the vigilance of mining companies, State inspectors, federal inspectors, and other agencies. In the course of 206



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federal mine inspections in one district, accumulations of explosive gas were found in seven mines, air circulation at the working face was found generally insufficient in four other mines, dangerous impounded water was found in another mine, and hazardous accumulations of fine coal dust or combined coal-dust accumulations with important gas liberations were reported in 19 mines.

The Bureau of Mines believes that federal coal-mine inspections over a period of years will assist in bringing about a marked improvement in safety. As a result of action by officials, miners and the states after inspections, and through the publication of reports of inspection findings, higher and more uniform safety standards eventually should be established in most coal mines. Good safety practices now in effect in many coal mines will be extended to other mines, where applicable, and this will result in lessened accident rates.

Many adoptions of the inspectors' recommendations have been reported by the operators. Some of the concrete improvements achieved include the substitution of permissible explosives for black blasting powder; the relocation, improved protection, and barricading of explosives magazines; better methods of handling and storing explosives; and other compliance with the Federal Explosives Act. The ventilation of numerous mines has been reported improved by the installation of new fans, overcasts, and air locks, and by cleaning obstructed air-courses and splitting the ventilating currents. Mines not previously protected against dust explosions have been rock-dusted and existing rock-dust applications evaluated and improved. Water sprays have been installed to allay dust at the source, during haulage, and in tipples.

Preventive Steps Taken

Possible initiations of explosions have been reduced by hauling on intake air, by employing permissible equipment, and by adopting electric cap lamps and the prohibition of smoking. Systematic timbering and careful roof testing are now being done increasingly in many coal mines. Better electrical installations reduce fire and shock hazards. Wider use of goggles and safety apparel has been gained. The activity and effectiveness of safety organizations have been increased, and greater interest in safety aroused.

The seriousness of mine accidents is accentuated by the war needs for coal. Accidental deaths and injuries in coal mining cost this nation a potential loss of approximately 11,000,000 tons of coal annually. Accidental deaths and permanent total disabilities remove over 1,400 coal miners annually from coal production, and some 60,000 other lost-time accidents cause a yearly loss of about 2,200,000 working days. These figures give some idea of the importance of the continuance of safety work during the war period.

According to estimates from the Office of Solid Fuels Coordinator, approximately 600,000,000 tons of bituminous coal and 65,000,000 tons of anthracite will be required to keep the nation's war program going forward in 1943. This is a tremendous responsibility for the coal industry and one that will call for the joint cooperation of the operators, mine workers, State mining departments and the Federal Bureau of Mines, if it is to be accomplished without an increase in fatalities and lost-time accidents.

The Bureau of Mines recognizes the importance of all inspection and

other safety work and will continue to work cooperatively with the coal industry to achieve results. Through courtesy, consideration, thoroughness

in inspections and cooperation in dealings with mine operators, miners and the states, the Coal Mine Inspection Division of the Bureau of Mines can

be a credit to the government and the mining industry, and a real aid in bringing about increased mining safety.

OUTLOOK FOR COAL

In Supplying Liquid Fuels and Coke*

Oil Shortage Probable in Long-Term Outlook—Oil From Coal One Logical Supplementary Source—Carbonization Byproducts Active—Anthracite Prospects Improve—Coal-Oil Mixture a Possibility

By ARNO C. FIELDNER

Chief, Fuels and Explosives Service,
U. S. Bureau of Mines

MILITARY demands for liquid fuels, shrinkage of coastwise shipping, and a market decline in the discovery of new oil fields during the last four years have changed the outlook for bituminous coal and anthracite in the near and more distant future. The immediate prospects for the coming year are that more coal will be required to meet war needs and in part to replace fuel oil for domestic and industrial use, especially on the Atlantic seaboard and in the Pacific Northwest, where shortage of transportation facilities makes it impossible to ship enough liquid fuel from the interior oil fields even though it may be available at the wells.

Long-Term Outlook—The long-term prospects are that coal must continue to replace fuel oil for industrial heating as well as supplement petroleum motor fuels in the more or less distant future unless an intensive exploratory campaign results in the discovery of prolific new oil fields.

Table I, prepared by Sylvain J. Pirson¹, of Pennsylvania State College, shows strikingly the decrease in net new reserves of oil discovered since 1938, even though the total number of exploratory wells has increased each year since 1939.

The proved petroleum reserves of

the United States as of Jan. 1, 1942, were estimated at 19½ billion barrels. The total production for 1942 was 1.4 billion barrels. At this rate of production, the proved reserves would be exhausted in 14 years. However, it is impossible to withdraw this oil from the ground at the rate of 1.4 billion barrels for each year. The rate of production from a given field decreases sharply in the early years immediately following discovery and then slows gradually so that perhaps as many as 50 years will be required to withdraw the entire present reserves. Hence, a shortage of oil will occur long before the reserves are exhausted. For this reason, preparation should be made before the need for more liquid fuel becomes imminent. Oil shale, coal and natural gas are logical supplementary sources of liquid fuels.

Oil From Shale and Coal—The oil-shale deposits of the United States have been estimated to have a potential yield of 92 billion barrels of crude shale oil, and the 3.2 trillion tons of coal and lignite deposits would yield 4,000 billion barrels of liquid fuels if all were converted by the Bergius or Fischer-Tropsch hydrogenation processes. On the basis of present knowledge, oil from shale probably will be cheaper than oil from coal. However, the oil-shale deposits are far from our centers of population, and further research probably will reduce the present high cost of liquefying coal (approximately 18 to 20c. per gallon of gasoline as compared with 5c. for gasoline from petroleum). For this reason the coal industry should have a very direct interest in the further development and reduction in cost of processes for obtaining oil from coal in comparison

with the distillation of oil from shale.

As a first step toward being prepared to liquefy coal to supplement our gasoline supply if and when required, the Bureau of Mines installed laboratory equipment at the Pittsburgh Experiment Station to determine the amenability to liquefaction of the various kinds of American coals. It has been found that practically all high-volatile and subbituminous coals and lignites can be liquefied by the Bergius process. The net yield of gasoline per ton of coal used was found to increase with the rank of the coal, being approximately 30 gal. for lignite and 60 gal. for high-volatile bituminous coal.

The Fischer-Tropsch indirect hydrogenation process can be used with any type of lignite, coal, anthracite or natural gas, since the solid or gaseous fuel is first converted to water gas and then by a catalytic treatment is transformed to synthetic motor fuel. The Bureau of Mines has been studying this process also and is constructing a laboratory-scale pilot plant of about 15 gal. per day capacity to test it.

The next step that the Bureau hopes to undertake as soon as materials and equipment become available is to construct and operate pilot plants on which commercial costs can be determined and the designs of commercial plants can be based. The work at such pilot plants would supplement Bureau of Mines tests of Colorado oil shale in 1927 and 1928, when two different types of full-scale commercial retorts were operated, and would thus provide similar information for the industrial development of oil-from-coal plants.

Immediate Outlook—Immediately before the United States entered the

¹Pirson, Sylvain J., "The Exploratory Oil Well Drilling Problem": *Mineral Industries*, Pennsylvania State College, Vol. 12, November, 1942, p. 1.

* Published by permission of the director, Bureau of Mines, U. S. Department of the Interior.

First World War, the annual production of bituminous coal was 500,000,000 tons. War needs increased production to a maximum of 579,000,000 tons in 1918. From that date the demand for bituminous coal wavered with the ups and downs of industry until in 1927 a decline began that ended at 310,000,000 tons in 1932. By 1936 the output returned to 442,000,000 tons, and in 1941, with the initiation of the defense program, production was 514,000,000 tons. It is estimated that 580,000,000 tons of bituminous coal has been mined in 1942, and the requirements for 1943 probably will approximate 600,000,000 tons.

It may be of interest to anticipate the probable distribution of the 600,000,000 tons of bituminous coal that should be produced in 1943. The distribution for 1940 is estimated as follows:

TABLE I—ESTIMATE OF BITUMINOUS-COAL DISTRIBUTION FOR 1940

	Net Tons	Percent
Locomotive fuel....	78,966,000	18.3
Electric power utilities	53,398,000	12.4
Coke ovens.....	81,386,000	18.9
Domestic and office heating	80,000,000	18.6
Manufacturing and all other uses....	136,974,000	31.8
Total	430,724,000	100.0

In round numbers, 20 percent of our bituminous-coal output was used for railroad fuel; 60 percent for industrial heat, power and metallurgical purposes; and 20 percent for heating our homes and office buildings. If these same percentages hold in 1943, 360,000,000 tons will be used for industrial heat, power, and metallurgical purposes alone, or nearly 85 percent of the entire output for 1940; 120,000,000 tons will be used as railroad fuel and a similar amount for domestic heating.

Metallurgical Coke—Almost any kind of clean coal can be used for ordinary heating, but a number of uses require special kinds of coal. For example, coal for the manufacture of metallurgical coke must have the property of fusing and developing a strong porous structure when heated in a coke oven. It should not contain over 7 or 8 percent of ash or more than 1.5 percent of sulphur (preferably less than 1.2). The best metallurgical cokes are made by blending 20 to 30 percent or more low-volatile coal, such as Pocahontas or New River, with high-volatile coking coal. The Appalachian region is fortunate in having both high- and low-volatile

coking coals. Under normal conditions much of the high-volatile coal, which is most abundant, is coked without the addition of low-volatile coal. However, at present, when coke ovens and blast furnaces must be pushed to their utmost capacity, more low-volatile coal is used because the throughput of the coke ovens can thus be increased and a denser and stronger coke is made, which permits speeding up the pig-iron output of the blast furnaces.

Approximately 70,000,000 tons of coke was produced in 1942. The War Production Board² has estimated that 75,000,000 tons will be required in 1943 and 79,000,000 in 1944. Ten



Arno C. Fieldner

percent of the 1943 and 12 percent of the 1944 production will be beehive coke. The expansion in coke production from the figures for 1941 to those for 1944 is planned on the basis of the construction of 1,904 new and the rebuilding of 344 old byproduct ovens and the construction of 500 new and the rehabilitation of 8,500 old beehive ovens. Resumption of beehive coking is a temporary expedient and regrettable from several points of view. Because of lack of technical supervision and of adequate coal-preparation facilities, many of the beehive installations are making poor coke of variable ash and sulphur content which cuts down greatly needed blast-furnace capacity. It is, moreover, unfortunate that no byproducts are recovered in the beehive process, yet all of these are very important in the war program.

² Weiss, Samuel. "The War Production Board's Aid to Industry in Expediting Production of Coke and Pig Iron": *Blast Furnace and Steel Plant*, Vol. 30, No. 11, November, 1942, p. 1246.

Byproducts of Coal Carbonization—Byproducts per ton of coal carbonized consist of approximately 10,000 cu.ft. of gas, 2 to 3 gal. of light oil, 10 to 13 gal. of tar, and 22 to 27 lb. of ammonium sulphate. About half of the gas is required to heat the coke ovens, and the remainder is used for heating purposes in nearby steel plants or distributed in city gas lines. All other byproducts are of very direct importance for the manufacture of munitions or essential war equipment. The light oil contains benzol and toluol. Benzol is our only source of styrene, which comprises 25 percent of the composition of synthetic rubber. Picric acid—used in explosives—also is made from benzol. Benzol is converted to phenol (carboic acid), and large quantities of the latter are used in the manufacture of Bakelite and other plastics.

Toluol is the basis for TNT, which is employed in shells and mines. The quantity of toluol available from coal carbonization is inadequate to meet the needs of the present war. Fortunately, toluol can be made also from petroleum, and sufficient quantities are being supplied from this source.

Coal-Tar Products

Coal tar provides phenols, cresols, and higher-tar acids, which are in great demand for the rapidly growing plastics industry, and uses are even found for all the pitch that can be made (although it formerly was a drug on the market) in the production of carbon electrodes for the expanding aluminum industry. Ammonium sulphate is used in the manufacture of explosives. In fact, much additional ammonia must be made directly from the nitrogen in the air to supply the large quantity required in modern warfare. Here, also, coal plays an important role in the manufacture of hydrogen from water gas. One cubic foot of nitrogen from the air is combined with 3 cu.ft. of hydrogen from water gas to make ammonia. Ammonia is oxidized with air to make nitric acid and nitric acid is used for making trinitrotoluol (TNT) and nitrocellulose (smokeless powder). These are two of the most important war explosives. There are others that also require the use of nitric acid and ammonia. In addition to these principal products, coal tar is the source of a large and varied list of medicinal preparations, photographic chemicals, dyes and miscellaneous chemicals.

Pennsylvania Anthracite—The shortage of fuel oil on the eastern seaboard is giving the anthracite industry

an excellent opportunity to recover a large part of its former market, especially that part lost to oil. Production of anthracite in 1924 and recent years is listed in Table II.

TABLE II—ANNUAL PRODUCTION OF ANTHRACITE IN PENNSYLVANIA

	Millions of Net Tons
1924.....	79*
1937.....	52
1938.....	46
1939.....	51
1940.....	51
1941.....	56
1942 (estimated).....	60

* Gross tons of 2,240 lb. each.

The required anthracite production for 1943 is estimated at 60,000,000 tons or more, and recent expansion of sales and research facilities of Anthracite Industries, Inc., indicates that the industry is working aggressively to increase the market

above these minimum requirements. Improvement in the efficiency and convenience of automatic domestic stokers and higher prices for fuel oil after the war as compared with pre-war prices should favor long-term retention of this regained domestic market.

The present shortage of fuel oil also has revived interest in the mixing of powdered coal with oil to extend the limited supply of oil for industrial oil-burning furnaces. Forty percent by weight of the mixture is the maximum proportion of coal that can be added without producing a composite or "colloidal" fuel that is too viscous for use in ordinary oil-burning equipment. Although conversion from oil to coal-burning equipment wherever possible is the logical procedure during the current oil shortage, use of colloidal fuel would extend the available supply of industrial fuel oil to consumer, who could not change to

coal-burning equipment. The Bureau of Mines³ and several industrial organizations are conducting practical tests in the use of such mixtures.

In making this brief review of the outlook for coal one is impressed by the fact that unprecedented war demands greatly exceeded expectations in the requirements for liquid fuels. Their exceptional utility in providing automotive power on land and water and in the air justifies thoughtful consideration of proposals to reserve our declining petroleum resources for such purposes in the national interest. A trend in this direction is likely to follow the war, and this trend—plus higher prices for fuel oil, greater production of smokeless solid fuel from surplus metallurgical coking capacity, and further improvement of stoker-fired residential furnaces—should provide the coal industry with a favorable share of the total fuel market after hostilities cease.

RESEARCH INTEREST GROWS

Although War Cuts Staffs and Projects

Coke Trees, Bane of Domestic Stokers, Cured by Preoxidation and Agitation—Lignite as a Means for Hydrogen Manufacture—Hydroaromatics Produced From Coal—Hydrogenation in Gas Manufacture

RESEARCH safely may be said to be taking a strong hold on the imagination of the coal industry and on the public, despite the fact that last year fewer research coal projects were in being than for many years. The loss arose from the inability of the college staffs to be as active in research as before the war because of the transfer of some of their personnel to the government services, civil and military, the active participation of other members of the staffs in the war effort and the absorption in some cases of their facilities by the armed forces.

Because its efforts were mainly devoted to the ores of critical metals, which are in greater need of study than coal, the U. S. Bureau of Mines' activity was mainly directed to the discovery of these ores and to means for their beneficiation. However, where new coal projects were needed to support the war effort, the Bureau started such investigations, usually at the expense of other older projects which

can wait until the war is over. In the tabulation, many are thus indicated.

The most cheering development was the 50-percent increase in the program of Bituminous Coal Research, Inc., based not so much on the persuasion and arguments of the institution's official family as on the overwhelming proof that such inquiries had solved many of the coal industry's problems already and seemed certain to solve many more. During the year, West Virginia University dedicated its new Mineral Industries Building.

On Dec. 20, 1941, a bill was signed by the President creating an Anthracite Economic Investigating Committee. When the report was made by the committee, legislation followed providing \$450,000 for a laboratory to be located in the anthracite region and \$175,000 annually for its maintenance.

Meantime, the State of Pennsylvania was sharing with the Anthracite Institute the expense of a research

program that had been started at Pennsylvania State College, covering the blending of anthracite with bituminous coal for the making of coke, the gasification of anthracite, its activation and its use as a foundry fuel.

In a similar manner the State of Pennsylvania continued to combine with the Central Pennsylvania Coal Producers' Association and the Western Pennsylvania Coal Operators' Association in the conduct of other inquiries by Pennsylvania State College, these being fly-ash removal in domestic-stoker operation, clinker formation in domestic stokers, industrial underfeed stokers, automatic comfort heating, domestic hot-water equipment and coal plastics. The same college is studying colloidal fuel on behalf of the Central Pennsylvania association.

Coal-mining operators are contrib-

³ Schroeder, W. C., "Use of Mixtures of Oil and Coal in Boiler Furnaces": *Mechanical Engineering*, Vol. 64, No. 11, November, 1942, pp. 793-798, 804.



Battelle Memorial Institute, Where Tests Have Shown How Coal Can Be Adapted to Exacting Market Needs.

uting real money to the elimination of the smoke nuisance, but the public cannot be said to be in full cooperation. Efforts to have smoke abated are active as ever, though in some ways they conflict with the war effort, and some believe that the smoke abatement ordinance of St. Louis, Mo., should be suspended for the duration of the war, for many of the smokeless coals that are specified in that city are needed for coke making, and they feel it is not well to require their use for any other purpose. However, the Missouri Supreme Court on Aug. 6 upheld the St. Louis smoke-elimination law.

Research is trying to cope with this problem, and it is believed that the correct type of stoker and stove and correct method of firing will do much to correct the smoke-forming tendencies of coals. Cincinnati, Ohio; Atlanta, Ga., and Nashville, Tenn., have steered clear of the drastic St. Louis ordinance. A redesign of combustion equipment is another route to smoke elimination and will make coal far less offensive than oil.

Using Ax on Coke Tree

Bituminous coal in Pennsylvania has a bad habit of coking and forming conelike coke trees on the grate of the domestic underfeed stoker which grow higher and higher as built up by the stoker from below. Pennsylvania State College, recognizing that even lightly oxidized coal will not coke, has arranged to admit warm air into the hopper for that purpose. Partial oxidation occurs almost instantly, and the coal is as well ordered thereafter as the most desirable of stoker coals. Smokelessness and almost dustlessness also are attained in the modern domestic stoker. Battelle Memorial Institute, Columbus, Ohio, for Bituminous Coal Research, Inc., and 29 large stoker manufacturers, has produced a space heater of excellent appearance with smokeless operation, magazine feed and automatic control.

Battelle also has solved in its own way the problem of the coking tendency of some coals; not, that is, by preoxidation, but by agitation. It has incorporated a revolving burner head in the center of an underfeed retort. Bituminous coal, introduced into the ignition zone, is agitated and concurrently sprayed with air so as to break up any coke that may begin to form while simultaneously consuming smokelessly its volatile constituents. Another type of stoker designed by Battelle has eight revolving concentric zones with the coal entering at the outer zone and being wiped by a deflector from zone to zone toward the center, where the ash from the fully consumed coal drops into an ashpit. The bed, having an intermittent movement, is constantly disturbed so that no coke can form. Thus, it appears that, with properly designed mechanism, all coals can be burned efficiently and automatically by the domestic consumer, and that without either trouble or smoke.

Coke has become the recognized fuel for making pig iron, but steel has been veering toward oil and natural gas. Pulverized coal will melt steel, but, unfortunately, it makes ash, and heat regenerators which are expected to use such a fuel must be redesigned to handle that impurity. Forge furnaces also can be heated with pulverized coal. Where ceramic or other ware must not come in contact with the furnace gases, radiant-tube furnaces are used and these can be heated with powdered coal.

Internal-combustion engines with coal as combustible have the obvious disadvantage that the burning of the coal produces a highly abrasive ash that scores pistons and valves, but Battelle hopes to meet that situation by the use of a cylinder which operates on a piston of water that is hurried out of the cylinder by the explosion to the top of a reservoir from which it can be permitted to fall through a penstock to a water turbine.

This system has proved effective with producer gas; it should be equally effective with powdered coal, but it still remains only a project.

Interest is keen as to the best means of blending expanding coal with other coals that furnace walls will not be pushed over, the coke will not be unduly creviced, and coking speed can be accelerated, thus meeting the demand for more and more coke to feed the blast furnaces in the nation's dire need for steel. Even in the peace time to follow, it would be intriguing to find some way of obtaining a large byproduct coke tonnage without the necessity of building row upon row of costly byproduct ovens, or to produce cupola coke from coal without subjecting it to the present long carbonizing period.

Are Inerts Gas Bleeders?

How inert or non-coking material prevents this breaching of oven walls is not clear. Perhaps it provides fine channels by which the gas may escape. To this end, fine inert rock materials, fusain, coke breeze or fine anthracite can be, and have been, used or a bituminous coal that will not swell. Perhaps a coal that is partly "dead," having lost some of its gas-making and plasticizing tendency, will give even better results, and stripped coal be better than coal from deep mines. So much, however, must not be added as to sap the strength of the coke, and the material must hold spaces open.

The effect of oxidation on the blending qualities of coal near the outcrop is being studied by H. C. Porter. Oxidation lowers the sulphur content and makes the coal less plastic under heat and may thus fit it for the coking role on both counts when used with highly expandable coals. If it cokes strongly enough, it should not weaken the aggregate. Anthracite, it has been found, should be hard or the final product will not have adequate strength.

Blending problems accordingly have several research workers busy. Pennsylvania State College has two such projects. The Coal Research Laboratory and the Koppers Co. are studying such pressures, their magnitude, and when, how and why they develop. Experiments at Laclede Gas Light Co.'s works have done much to throw light on the value of anthracite as a means of shortening coking time without rendering the product unfit for foundry use.

Prohibition of the use of oil for allaying dust has increased the interest in calcium chloride. West Virginia University has two projects relating to the use of that chemical, and Battelle interested itself in all substances that could be used for that purpose, even before the denial of petroleum products to the industry was promulgated.

Traced by Lead Acetate

In its studies of the penetration of coal by liquids as suggestive of what happens with oil, Battelle has done notable work. After immersing coal in a water solution of lead acetate, it was possible to radiograph the penetration of this salt to bring out on a photographic plate the presence of crevices and to compare the penetrability of the several types of coal and of the different petrographic fractions of the same coal. Fusain and vitrain appeared to absorb more of the solution than durain. Coal from the Illinois No. 6 seam was found, as expected, to admit more liquid than that from the Pocahontas No. 3 seam.

During 1941, the University of Washington conducted a series of full-scale tests at Michel, B. C., in the ovens of the Crows Nest Pass Coal Co., and as a result a battery of 17 Curran-Knowles sole-flue byproduct ovens was erected at Tacoma, Wash. A new mine is being opened at Wilkeson, Pierce County, Washington, and a new washery is being constructed to prepare this coal for the plant at Tacoma.

The State of Utah, through its Department of Publicity and Industrial Development, has signed a contract with the Coal-Logs Co. for the erection of a plant at Salt Lake City for the low-temperature carbonization of 50 tons of Utah coal per day. The State furnishes \$35,000. Waste slurry from washed non-coking bituminous coal will be treated in a horizontal vibrating retort, and while in a semi-plastic stage will be compressed to form 2½-in.-diameter cylinders or "coal-logs."

The usual tar oils will be recovered as byproducts and sold to the refineries for the making of critical materials

needed in the war effort, and the by-product gas will be used for heating the coal. The Washington office of the War Production Board has been furnished detailed material lists and other information and will be asked to grant permission for the erection of the plant. Also, for the production of high-temperature coke, it is proposed to carbonize the coal-logs further by heating them to 2,000 deg. F.

A Curran-Knowles sole-flue oven plant capable of carbonizing 300 lb. of coal per day has been built by the Illinois Geological Survey, and a few preliminary runs made with coals of known coking characteristics. It has been planned to continue this study first on the lower sulphur coals of Illinois to determine whether they can be substituted, at least in part, for eastern coals in the production of metallurgical coke. Later, other coals will be studied as to their suitability for domestic coke.

At the University of Minnesota, Prof. L. H. Ryerson has developed an economical process of separating hydrogen from steam by passing the latter through char made by low-temperature carbonization of lignite. The hydrogen is then purified and in the process methyl alcohol is obtained, a base for formaldehydes and for certain kinds of plastics.

Gas Made With Hydrogenation

For 18 months, Purdue University in its Chemical and Metallurgical Engineering School, has conducted research, for the Indiana Gas Association, on the hydrogenation of coal at high temperatures and pressures, seeking preliminary data on the production of a gas of high calorific value having a composition and burning characteristics approximating those of natural gas. It has been found that gas of a calorific value of at least 900 B.t.u. per cubic foot can be produced. Moreover, much has been learned regarding the reactions involved when coal is hydrogenated at temperatures above 400 deg. C. It is expected that the temperatures will be raised to 700 deg. C. with accompanying pressures of about 100 atmospheres.

So much stress has been laid on fuel beds and on combustion in the reducing atmospheres there present that it is with relief that the industry learned that E. G. Bailey, president, Babcock & Wilcox Co., has been studying the ash formation and clinkering of the dust that travels with the gases from the furnace. These are in an oxidizing atmosphere. In such air, clinkering occurs at a higher temperature, so coals that do not meet the exacting requirements in a reducing at-

mosphere will acquit themselves better in the region around the boiler tubes. Research by Mr. Bailey has consisted of determination of ash-fusion temperature on an oxidizing and on a reducing basis and in the ascertainment of iron percentages and degree of oxidation of the iron of a large number of samples collected from various locations in boiler furnaces under many operating conditions.

His research on coal combustion has included many complete tests of large boiler furnaces in which multi-shielded high-velocity thermocouple measurements of furnace temperatures have been taken and the heat absorptions checked by the thermal probe. Excess air at different furnace sections has been determined and the gas flow patterns of furnaces studied.

For the complete evaluation of the coke- and gas-making properties of a coal many tests are required, for the coal must be carbonized over as wide a range of temperatures as is customarily used in industrial practice. Factors are being studied by the U. S. Bureau of Mines such as the effect that weathering of the coal has on its coking qualities, the pressure the coal exerts on the oven walls during coking, and the effect of preheating of the charge before coking. Full reports for some coals and blends were issued in T.P. 628, 630, 634 and 644, and a descriptive index of the coals tested to date in the carbonization survey appears in T.P. 637. It is found that the carbonizing properties of a coal cannot be correlated closely with its rank and type; precise information can be determined only by a separate test of each coal (R. I. 3601).

West Also Can Make Coke

A wide difference is found in the coking power of eastern and western coals, but tests have indicated that Oklahoma, Arkansas, Utah, New Mexico, Colorado and Wyoming produce some coals that are suitable for conversion to metallurgical coke. Properties of cokes made at 800 and 900 deg. C. from coals of various ranks have been tabulated in R.I. 3650. Blending 20 or 30 percent of low-volatile coals with 80 or 70 percent, respectively, of high-volatile coals gives cokes of improved but varying properties, so that knowledge of the characteristics of either kind of coal is not of itself sufficient for calculating or predicting the properties of the coke. Plastic properties of coals and blends in connection with the carbonization survey are discussed in the Bureau's Bulletin 445.

Observation has shown that during carbonization, no group of bituminous coals has as little fluidity as low-volatile

coals. The medium-volatile group becomes more fluid, and maximum fluidity is reached in the high-volatile A group containing 63 to 66 percent of dry mineral-matter-free fixed carbon. Only by consideration of the petrographic composition of exceptional coals can the anomalous behavior of coals of different ranks be explained. In general, oxidation will reduce progressively a coal's plasticity and fluidity.

If mines are to be kept running at full capacity throughout the year, large quantities of coal must be stored in such a manner that its properties are not appreciably impaired for coking and for combustion purposes. The length of time a coal can withstand the action of air at 100 deg. C. without losing its ability to coke is a specific property of the coal and is termed the "durability of its coking power."

High-Volatiles Deteriorate

Coals having a low content of volatile matter lose their caking tendency more quickly than those which have a medium content of volatile matter, but coals of high original oxygen content have been found by the U. S. Bureau of Mines to lose their caking qualities quickly, regardless of their volatile-matter content. Comparison of the strength of cokes from coal oxidized just enough to decrease by 15 percent the strength of the coke reveals that coking power decreases during storage of coal at about the same rate as the caking tendency.

Studies pertaining to the swelling properties of a coal during the coking process have revealed (R.I. 3644) that bulk density of the coal charge is one of the important variables which determine the pressure that will develop in an oven. The relationship is not simple but depends upon the following considerations: (1) When bulk density is increased, more coal is crowded into a given space, thus more gas can be released and more pressure developed; (2) fewer voids are available to provide relief for this pressure, and (3) as the developed pressures increase at higher bulk densities, the coked portions have a greater tendency to compress the uncoked portions of the charge, thus the higher pressures increase cumulatively as coking proceeds.

In studying the action of coal ash at high temperatures, the Bureau centered its attention on control of the deposition of slag on heat-absorbing surfaces so as to determine slag properties under conditions existing in actual installations. As was first recognized in 1942, in the continued operation of furnaces under peak loads, coal-ash slags apparently cause wall

and superheater tubes to lose metal by corrosion.

A procedure has been developed by the Bureau whereby coal-ash slags of known composition can be melted in the laboratory and maintained for indefinite periods at any state of reduction representative of typical furnace slags. The density of a slag depends upon its composition and increases with increase in the total equivalent Fe_2O_3 content. In an endeavor to explain the variables which determine the adherence of slag to boiler surfaces, surface tensions are being measured to correlate the behavior of slags with such variables.

With "synthetic" slags formed from mixtures of pure chemical compounds, actual slags are being simulated for the determination of these physical characteristics. As an aid to design and operation of furnaces, the research on synthetic slags in laboratory equipment is being correlated to actual operations, and the mechanism of the reactions is being studied as a means of solving the problem of boiler outages.

Solid fuels have been burned by the Bureau in such manner as to simulate the crossfeed principle by which, on chain-grate stokers, weekly caking coals and free-burning fuels, such as anthracite or coke, are consumed industrially. Fuel entering the furnace is ignited in one of three ways: (1) by conduction of heat from the existing fuel bed; (2) by the fall of burning particles on the surface of the entering fuel when such particles are carried back over that surface by the gas stream, and (3) by radiation from the hot surfaces of the furnace.

Radiation Is Being Studied

During the year 1942, a study was made of radiation. For this purpose, radiometers were developed and mounted on opposite sides of the furnace wall so that studies could be made relating time required for initial ignition of the surface of the fuel bed to fuel size, and rate of air supply or temperature of preheat to specified rates of heat transfer to fuel surface.

To evaluate the suitability of a fuel for combustion processes, a procedure has been developed whereby the relative reactivity of various solid fuels may be measured. Small samples of fuel are heated, one in air and the other in oxygen. From respective temperatures taken when the atmosphere liberates enough heat to cause the sample temperature to exceed that of its environment, the reaction rate can be calculated. Started in 1942, the research helps to explain data obtained on crossfeed ignition of fuel and throws light on coal-storage problems.

Hydrogenation is part of a long-range program undertaken by the Bureau of Mines to establish a sound groundwork for the evaluation of foreign developments in synthetic liquid fuels and to ascertain the amenability of various kinds of American coals and lignite to the hydrogenation process. The United States' large reserves of petroleum are adequate for present demands, but the war is hastening the time when these will be so depleted that the growing national need for motor fuel will have to be supplemented by gasoline made from coal. The program will help American industry to meet the demand when it comes.

Studies are made in a small experimental plant having a capacity of about 100 lb. of coal per day. A mixture of about equal parts of powdered coal and a heavy oil along with hydrogen under 200 to 300 atmospheres pressure and a catalyst is pumped into a vertical tube heated in the range 806 to 860 deg. F. The contact time and temperature are varied so as to determine the maximum yield of oil which the stream of hydrogen will carry out of the converter.

Split Into Hundred Parts

Fractionation of the assay oils from the liquid-phase hydrogenation of eight coals, varying in rank from medium-volatile bituminous to lignite, gave a neutral oil which was then fractionated. Composition of each of the 100 fractions was determined by physical means and analyzed quantitatively for carbon and hydrogen. Characterization of the assay oils is shown in T.P. 646. Refining the gasoline fraction gave a product having an octane number of 68 to 69; its antiknock value was increased to between 80 and 81 by addition of 3 cu.cm. per gallon of lead tetraethyl. A subbituminous coal from the Eska mine, Alaska, assayed 62 percent oil based on the weight of coal as mined and washed, or 43 percent gasoline on the same basis.

In T.P. 642 is revealed the relation between the petrographic composition of a coal and the residue inert to hydrogenation. Low-rank coals appear to be more sensitive than bituminous coals to change of experimental conditions, and do not require much more hydrogen than do high-volatile bituminous coals. Spores, resins and oil algae are readily liquefied under mild conditions; 40 to 80 percent of the opaque attritus, and 10 to 55 percent of the fusain respond to more drastic conditions of temperature and pressure.

Below 300 deg. C., the quantity of

hydrogen absorbed depends upon the rate of its reaction with unsaturated molecules. Up to 370 deg. C., the rate of hydrogenation exceeds the rate of diffusion through the liquid film on the surface of coal and catalyst, and above 370 deg. C., the coal is depolymerized and combines with the solvent. Hydroaromatic compounds act as hydrogen carriers, and activity of these compounds depends on the nature and quantity of catalyst. Rate of oxygen removal and coal liquefaction, however, are independent of catalysts when an excess of tetrahydronaphthalene is present (*J. of Am. Chem. Soc.*, 1942). At 400 deg. C., hydrogen consumption decreases with increase in temperature, resulting at higher temperatures in pyrolysis and coke formation.

As mine production must be kept at its peak throughout the year, some industries must store coal in large quantities, so the Bureau of Mines is tabulating experience, favorable and unfavorable, in commercial and small-scale coal storage. Past experience, problems and suggestions on coal storage have been published as I.C. 7211. Simultaneously, work is being conducted in the laboratory to evaluate the relative reactivity of solid fuels and to determine experimentally their characteristic oxidation rate and their spontaneous-combustion index so that studies pertaining to safe storage of coal may be correlated.

Seek Safe Way to Store Coal

Bureau of Mines research investigation is in its preliminary stages and at the present time methods of storage that may be considered include: (1) storing under water; (2) storing slack coal in layers 2 and 3 ft. thick on hard or compacted earth or clay; (3) storing slack coal in uncompacted piles only about 6 ft. high; (4) storing of slack coal in bunkers or silos in such a manner as to avoid segregation of sizes; (5) complete removal of fines in storage of sized coals; and (6) observation of temperature of the stored coal in selected areas and at selected depths to determine to what extent the coal is heating spontaneously.

As usual, the Coal Research Laboratory of the Carnegie Institute of Technology, despite its few concisely stated objectives, has made a large number of tests that could well be more completely and interestingly subdivided, thus forming a multitude of projects.

During the year the committee on "Ignitibility" of the American Society for Testing Materials decided to present in standard form, for information only, the method of determination of the reactivity of solid fuels which the

laboratory has developed. In this proposed standard, two indexes are determined, T_{15} and T_{75} , which signify the temperature at which the reaction between 40x60-mesh fuel and oxygen begins to proceed so vigorously as to raise the temperature 15 or 75 deg. C. per minute respectively.

It will be noted that the indexes are minimum temperatures for a certain rate of reaction and therefore the lower the temperature, the greater the reactivity. It is an inverse, not a direct, relation; the smaller the figure, the more susceptible the fuel to oxidation.

Ash Lessens Reactivity

When the ash percentage increases, it is found that the coal becomes less reactive; that is, T_{15} increases. Some ash may be catalytic but not in this instance. High reactivity at a low temperature appears to be associated with a high content of iron in the ash. As alkalis also are known to aid the oxidation of carbon catalytically, a micro-method for their determination has been developed for use in this study.

Efforts are being made by the laboratory to modify the standard so as to permit the use of all coal below 60-mesh as is specified by the A.S.T.M. in the making of chemical analyses, because when only the 40x60-mesh sample is used, as is now arranged, material below 60-mesh is discarded, and the criticism which has been raised that the material discarded may have a different reactivity from that of the sample tested will then be met. But this will require measurement of specific surface, as minus 60-mesh coal may contain from 20 to 80 percent of minus 200-mesh material, depending on the method of size reduction. The finer the coal, the greater the area in contact with the oxidizing atmosphere and the more rapid the oxidation. Says the laboratory, additional tests should be made to ascertain in what manner additions of inorganic catalysts will affect the reactivity of coke.

An electric analogue of a fuel bed has been partly assembled, and it is hoped that, when completed, it can and will be used for the further study of temperatures and gas compositions in fuel beds, which is at present suspended. Study of the combustion of pulverized coal revealed that incompletely burned residues from such combustion had been converted into bubble-like cenospheres of coke.

Previously, it had been assumed that the cenospheres are formed only from a narrow range of coal sizes, and this view was taken at the annual meeting of the American Society of Mechanical Engineers, where it was declared that minus 200-mesh particles would

not form cenospheres. However, when residues from coals of the Pittsburgh and Pocahontas seams (170-200 mesh) and from Illinois coals (100-140 mesh) were examined microscopically it was found that they were all cenospheres.

The laboratory has dealt largely with the effect of furnace conditions upon degree of combustion. Other variables to be considered, Dr. H. H. Lowry, the director, asserts, are higher furnace temperatures, a wider range of coal samples, variant ash contents and fineness of particle sizes.

In the formation of aromatic acids of benzene carboxylic series, it was found that, in general, the higher-rank materials react more slowly than those of lower rank but ultimately give larger yields, especially of the highest member of the series, mellitic acid. Under favorable conditions as much as 30 percent of the carbon of bituminous coals can be recovered as mixtures of such aromatic acids. Oxalic acid may prove also a valuable "by-product" of the process.

However, such oxidation methods as require the use of chemical reagents usually are not cheap enough to be of commercial interest, because with a Pittsburgh seam coal, for instance, about 1.7 lb. of oxygen is required for each pound of coal oxidized. Alternative methods are being investigated.

Pushful Coals Studied

Studies made with gages for measuring pressures of a coal charge in a coke oven were compared by the Coal Research Laboratory with those obtained with a carbonizing unit having a movable oven wall as used at the Seaboard Laboratory of the Koppers Co., Kearny, N. J. The pressures shown by these gages when plotted against time showed, as did the Kearny unit, that peak pressures occurred about at the moment when the flanks of plasticized coal on the two sides of the oven meet at the oven center, but the peak pressures as measured by the gages proved to be much greater than as indicated by the pressure recorders on the moving wall.

This may be because the rigidity of the coke charge caused more load to be transmitted to the gage head than would correspond to the area covered by the gage or it may have been due to the maximum pressures not being developed simultaneously at all points in the oven. The Kearny unit registers average pressure at any given time whereas the gage registers only the localized pressure; how accurately is a matter for determination. Using 50 gages, as planned, the correct explanation probably can be ascertained.

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* Items starred indicate that the work on such projects was in progress during 1942 and was still continuing at the close of that year.

† Items with dagger were concluded in that year.

° Items marked with small circle indicate that an article has appeared describing some of the results of the investigation.

‡ Items marked with a double dagger indicate that a report probably will be made in 1943 or in the year therein indicated. Dates in parentheses which accompany references to article give year of their appearance.

• Items thus marked are projects apparently not hitherto listed. Names of projects change and some projects narrow or expand and may be recognized only with difficulty; thus this indication serves merely to call attention to the items thus signaled.

§ Items thus marked are suspended for lack of assistants or for duration of war or both.

Figures shown in parentheses against name of project indicate year in which project was started. Those marked (1943) are projected to start in that year. Absence of notation indicates informant failed to declare year of initiation or status of project. Notations following name of scientific body making the research and of the company or institution sponsoring it refer to papers or reports in which these investigations were, in whole or in part, communicated.

Certain of the items in the listings might with almost equal propriety be grouped under some other heading. Where the project is of multiple interest or where it cannot be listed under any one subject, it is placed under "Surveys" or "Miscellaneous." Groupings have been changed from year to year as interest in certain lines of research have risen or fallen.

Abbreviations: Agri., Agriculture; Am. Gas Assn., American Gas Association; A.I.M.E., American Institute of Mining and Metallurgical Engineers; Anal. Ed., Analytical Edition; Anth., Anthracite; Anth. Ind. Lab., Anthracite Industries Laboratory; A.S.M.E., American Society of Mechanical Engineers; A.S.T.M., American Society for Testing Materials; Battelle Mem. Inst., Battelle Memorial Institute; Bit. Coal Res., Bituminous Coal Research; Carnegie Tech., Carnegie Institute of Technology; Coal Research Laboratory; C.P.C.P.A., Central Pennsylvania Coal Producers' Association; Chem., chemistry; Circ., circular; Com., committee; Comm. Test. & Eng. Co., Commercial Testing & Engineering Co.; Conf., conference; Econ., economic; Fdn., foundation; Geol., geology; G.S., Geological Survey; I.C., Information Circular; Ind. and Eng'g. Chem., Industrial and Engineering Chemistry; Inst., Institute; J., journal; J. Am. Chem. Soc., Journal American Chemical Society; Mellon Inst., Mellon Institute of Industrial Research; Min. Ind. Exp. Sta., Mineral Industries Experimental Station; Penn. State, Pennsylvania State College; Res., research; R. L. Report of Investigations; Surv., survey; T.P., Technical Publication or Paper; U.S.B.M., United States Bureau of Mines; Univ., university; W.P.C.O.A., Western Pennsylvania Coal Operators' Association.



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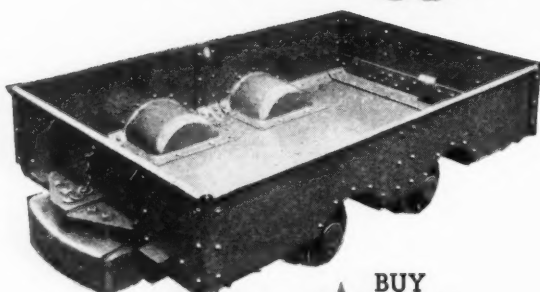
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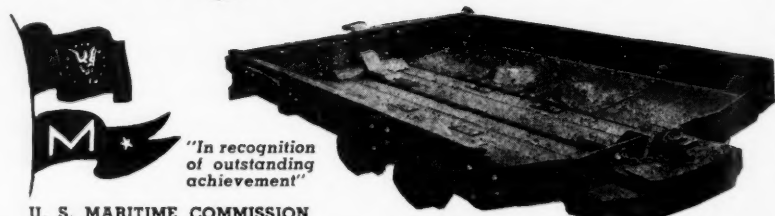
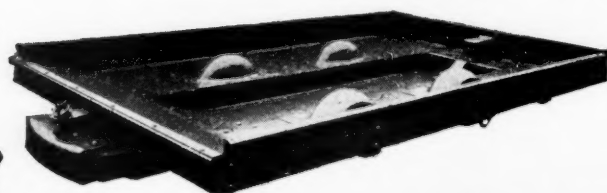
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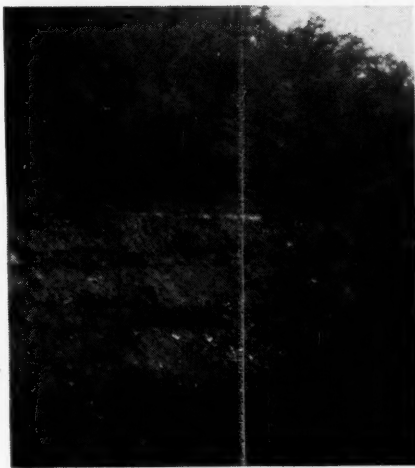


Double Switchback Solves War-Time Haulage

By building a tramroad and a double switchback to tap two coal seams the Red Jacket Coal Corp. averted the construction of a trestle 900 ft. long and 220 ft. high in opening a new 4,000,000-ton territory for the No. 32 mine in Mingo County, West Virginia. Original planning some years ago when structural steel was still plentiful called for crossing a hollow on a high trestle which would extend from a drift opening of the old mine to a new drift to be opened on the opposite hillside. The revised plan of a tramroad crossing nearer the head of the hollow required 30,000 cu.yd. of excavation and 9,000 ft. of track but proved much cheaper than the trestle project, and some trackage, even with that which would be required to get the loads down from the upper seam to the lower in which the main haulage extends three miles through the old mine to the tippie.

Interval between seams, the upper and lower Red Jacket (Cedar Grove), is approximately 68 ft. These are worked simultaneously on lines directly above one another. On the accompanying off-scale drawing, *U* denotes crop lines of the upper seam and *L1* and *L2* the crops of the lower. Arrows indicate the direction of coal haul.

The opening to the crop at *L2* from the old mine was driven several years ago and served as an airway. It was opened to seam height only—that is 37 in.—so 2 ft. of bottom was taken recently to provide height for a main haulway. This lifting was carried on from two directions, using Joy loaders. The material loaded from the crop end was carried by chain



Tramroad tracks at three levels.

conveyor directly from the loading machine to a dumping point over the hillside.

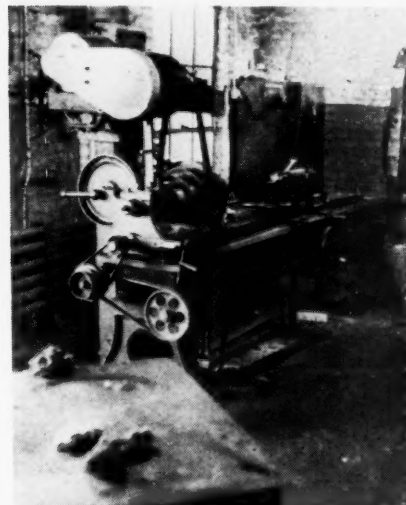
For the tracks, 56-lb. rails were made available from the old logging roads of the parent interest, the W. M. Ritter Lumber Co. Most of this rail is quite old; some rails were noted with an 1881 date. The halftone shows the excavations and grades ready for the three tracks at A-A on the drawing.

Tools for the Electric Shop Add to Convenience

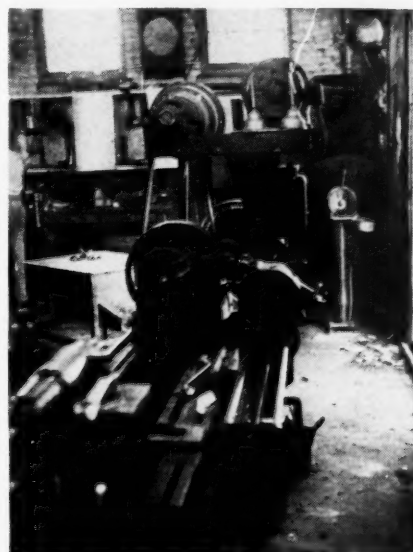
The customary standard tools of the electric shop do not always serve best for special jobs. Herman L. Seekamp, chief electrician, Superior Coal Co., Gillespie, Ill., and his shop force have not only

modified tools to fit the job but have built their own from cast-off and picked-up material.

Starting with a standard lathe, a pedal-operated individual motor drive and a

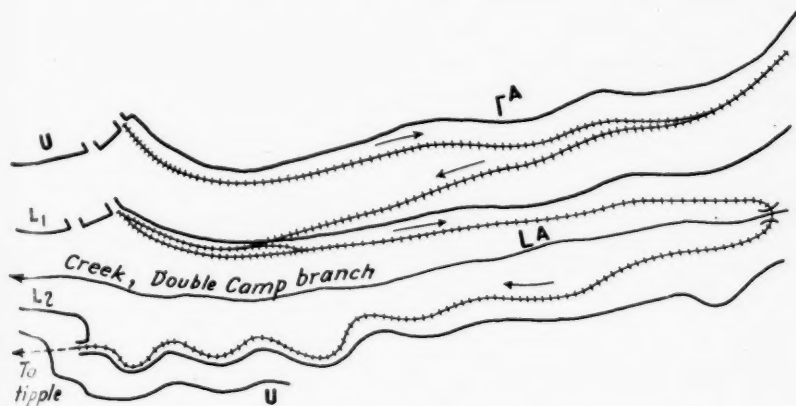


Lathe arranged for banding armatures. Note foot treadle.



Bander mounted at back of lathe bed.

Peerless banding machine have been added to present facilities to make an easily controlled machine for banding armatures. The motor-drive assembly was built in the machine shop. The motor and the speed-



Tracks serving workings at two elevations and keeping mine cars turned right end to for dumping at the tippie.

reducing drive are mounted on a tilting base above the headstock. The base movement releases the cone-pulley belt to stop the lathe or to shift the belt. Motor control is by contactor mounted beneath the motor. The start-stop switch, used in place of a pushbutton, is mounted on the floor and operated by a foot treadle from either the front or the back of the lathe. The Peerless bander, a device to put proper tension in the banding wire, is mounted on ways attached to the back side of the lathe bed. This bander may be moved parallel with the lathe bed by a hand-operated screw having 36 in. of travel. This machine will handle any motor armature in the mine.

A compact coil winder for drill and other small armatures, or for stator coils, was built of various stray parts and a little scrap. The base is a disk of steel plate to which is welded a short pipe pedestal. The principal mechanical item is the drive from a Thor washing machine. It is used complete from driving pulley to wringer clutch. On the clutch shaft there is mounted a faceplate, also a form or reel on which the coils are wound.

The 1/6-hp. motor came from a water cooler. It is controlled by a contactor, which, in turn, is energized through a foot-



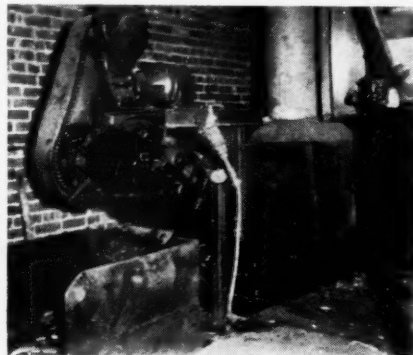
Handy coil winder, built from odds and ends around the shop.

operated pushbutton. The speed of the motor is varied by a resistor in series with the motor field. This resistor is a carbon disk unit from an Allen-Bradley motor starter. Pressure on the disks is provided either by hand adjustment or automatically when the reel clutch is thrown into gear. In the latter case, a lug on the clutch handle compresses the disks when thrown into running position.

Under the eyes of the operator is a revolution counter actuated by a cam on the reel shaft. As coils are wound, they are hung on a convenient rack until the full set is completed.

Conveyor, Quenching Machine Supplement Bit Sharpener

A conveyor and oil-quenching machine for use in connection with a Sullivan bit-sharpening machine has been devised by P. W. Dobson, master mechanic, Wildwood mine, Butler Consolidated Coal Co., Wildwood, Pa. Built in the Wildwood



Conveyor and oil quencher for sharpened bits at Wildwood mine.

shop, the steel conveyor belt is operated by a roller chain on each side. This picks up sharpened cutter bits from the bottom of a one-barrel-capacity oil tank, where the hot bits from the Sullivan machine are oil-quenched.

Bits are carried up and dumped into a temporary stockpile. From here they are taken to be ground and tipped with hard-

facing material. The machine is operated by a 3/4-hp. electric motor connected with reduction gear.

Lively, Please!

With the increased use of machinery, particularly of the high-tonnage type, trouble means fast action on the part of the men at the mine if output is not to suffer severely for the day. So the prudent mining man tries to forestall trouble by removing all possible causes in advance, at the same time keeping in reserve a number of remedies which can be applied immediately in case any difficulty does arise. Such remedies may come out of his own head or may be based on the experience of others. These pages are designed to present what the other operating, mechanical, electrical or safety man has done. So if you have an idea that will cut cost, increase production or promote safety, here is the place for it. And, to make it worth your while, *Coal Age* will pay \$5 or more for each acceptable idea. A sketch or photo should be included in case it will assist in making the idea clearer.

Conveyor Idlers Kept Clean and Efficient By Proper Lagging Application

"ALL BELT CONVEYORS, especially those that carry moist or damp materials," writes Charles E. Chandler, Brownsville, Pa., "deposit some fine dirt or 'bug dust' on the face of idler and drive pulleys where the carrying side of the belt comes in contact with these pulleys despite the fact that the belt may be equipped with scrapers and brushes to clean off this excess material. This material must be cleaned out from under the return belt carriers frequently, but the greatest problem is keeping the pulley faces clean. If the material being carried is extremely wet or dry, there will not be much adherence of the fine dust to the pulley, but where the material is just damp or moist, the dirt will build up in ridges or patches, getting larger and larger all the time.

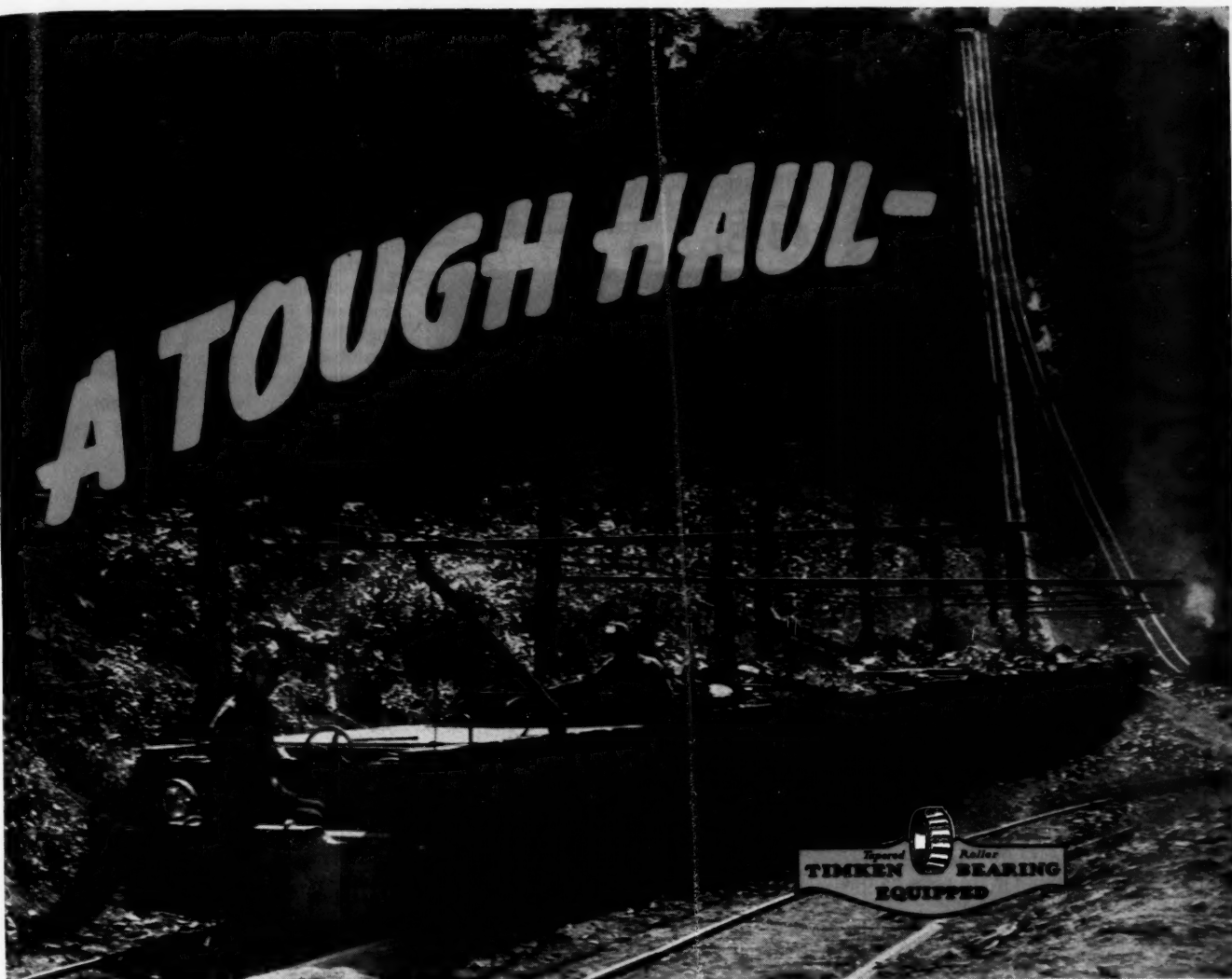
"It readily can be seen that this building up of material doesn't do the conveyor belt any good, for if the belt is of any length there is quite a tension on it, and a belt rolling over these bumps and ridges is the same as a tire traveling over a bumpy road. Every time the belt rolls over these uneven places it must stretch a little out of its natural shape, and eventually this will cause ply separation and breaks in the carcass.

"Many devices have been employed to keep pulley faces clean, the most common being a scraper with a sheet-iron blade or

a piece of old conveyor belt. Brushes also are used, but their replacement cost is high in labor and material. The best method of keeping pulley faces clean is by means of a rubber covering, so that when the dirt starts to collect, the rubber will "creep" a little, thus dislodging the thin layer of dirt before it has a chance to get very large. Old conveyor-belt top cover has been tried out for this job, but has not proved successful, as the rubber covering on old belts is too thin and too hard. Pulley lagging should be made up with two or three plies of canvas for a base and have a covering of extremely pliable rubber 1/4 or 5/16 in. thick. The old method of installing lagging on pulleys was to put it on in two widths to the pulley, each section extending from the edge to the center of the idler. This necessitated removal of the conveyor belt from the idler and some means of blocking the idler, as the lagging must be put on under tension.

"A newer type of idler covering has been developed, made in widths of about 5 in., which can be installed by two men in several hours' time. This narrow lagging is spiraled on the idler as the conveyor belt is moved slowly around, it being unnecessary to remove the conveyor belt for this type of installation. The new lagging is made with a step joint, insuring

A TOUGH HAUL-



BUT TIMKEN BEARINGS CAN TAKE IT!

Timken Bearing Equipped cars get rough handling at the Princess Dorothy Coal Company, Eunice, W. Va.; not that the cars are deliberately abused, but the nature of the haul is such that some abuse is impossible to avoid.

For example, the trip shown in the photograph has just been lowered down the steep incline in the background at considerable speed. It now is ready to proceed through a mile-long tunnel, thence to the dump and finally down another long and sharp incline.

Sometimes cars get away on the incline and dash violently to the bottom; not a single Timken Bearing has been damaged in this way however. The cars are very large, each carrying 6 tons of coal without difficulty.

The Princess Dorothy Mine is one of the biggest in West Virginia, producing approximately 80 railroad cars of coal per day. The more Timken Bearing Equipped cars you have in your mine, the more coal you can get out. The Timken Roller Bearing Company, Canton, Ohio.

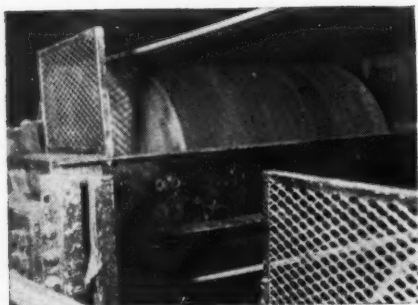
The One
Test For Every
Decision—Will It
Help To Win
The War?

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

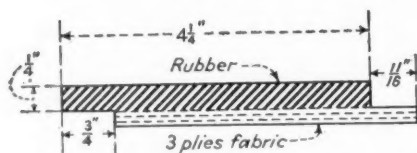
"All There Is In Bearings"



Spiral lagging on a take-up pulley.



Unlagged pulley removed from service because scrapers had worn it too thin for safety. Note tightly adhering dirt.



There is a $\frac{1}{16}$ " difference in the steps as this makes for a tighter joint when lapped.

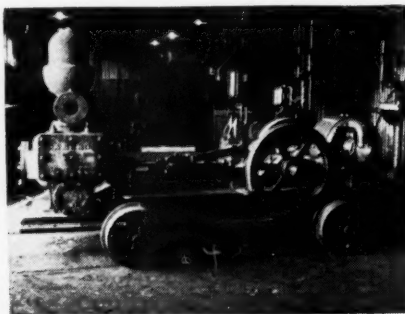
Cross-section of spiral lagging

that moisture will not get between the face of the idler and lagging and cause the canvas to rot. This type of lagging has been installed on a number of take-up bogey idlers at one of the larger conveyor systems in the country for over two years of continuous operation and has been found highly satisfactory. The lagging must be put on under tension and the step joint and the pulley face should be painted with Vucalox rubber paint or some other good waterproof coating.

"Until a few years ago conveyor-belt engineers were convinced that every idler and drive pulley had to have a crown in the center to make the belt run a true course. This has not proved to be the case, however, as there are some installations where the drivers are faced flat and others are made flat by the use of tapered lagging. This tapered lagging is made by taking a thick piece of belt and stripping it down in steps of $2\frac{1}{2}$ in. each until the desired taper is reached to compensate for the crown. Edge breaks, which are the bugaboo of any maintenance man's life, are noticeably decreased with the use of the flat pulleys or those lagged with tapered lagging. Where flat lagging on crowned pulleys has to be renewed every two or three years, tapered lagging on the same pulley need not be replaced for a 6- or 7-year period, as the wear is even all over the face of the pulley and not just at the crown."

Scrap Becomes Alive In New Pump

A keen eye for parts among scrap materials in the shop, a little machine work and the diligent application of arc welding produced the pump shown in the accompanying illustration—a much needed unit that could not be bought. The basic unit in the assembly was the water end of a No. 9 Cameron steam pump. The



Years of service are expected from this pumping unit, assembled largely from miscellaneous scrap parts.

driving motor was an idle power unit. Gears, shafts, bearings, connecting rod, crosshead and crankshaft were all leftovers from the old days when the steam engine was the universal source of power. This job of making what is available meet the demand of the day was done by the mechanical department of the Consolidated Coal Co., Herrin, Ill.

Perfect Month Is Recorded On New Seco Board

No lost-time accidents on any one of the 30 days of November was the achievement proclaimed at the close of the month by 30 green tags hanging in two rows at the top center of the new safety record board at the Seco (Ky.) mine of the South-East Coal Co. Operating two shifts, the mine shipped in that month 34,046

tons. Operation is in the 57-in. Elkhorn seam and all coal is handled with Goodman shakers, all but two of which are equipped with duckbills.

Appropriately, the red brick columns at each end of the safety board are decorated with "V" in white brick. At the left and right top corners of the board are green and red lamps with legends, respectively; "No Accident Yesterday, Keep This Light Burning," and "Accident Yesterday, Don't Let This Light Burn." At the lower left is a cabinet of animated type furnished by Advertising Displays, Inc.; next a frame displaying a War Savings Bond and Stamp sign and in the center are two frames for current bulletins on mine operation.

To the right is a bronze tablet of the 1941 safety award by the Big Sandy-Elkhorn Coal Mining Institute for the best safety record among the Class A (larger group) mines of the district. In the cabinet at the lower left are the names of employees and employees' sons in the armed service and this includes Lieut. M. L. Picklesimer, son of V. D. Picklesimer, general superintendent. At the bottom, in the center, is a suggestion box.

In addition to Seco, the company operates a mine at Millstone, nearby and in the same County, Letcher. Alan J. Smith, of Cincinnati, is president and Harry LaViers, of Painstville, is vice president and general manager.

Rewinding Time Reduced By Mica-Cloth

Use of mica-cloth for slot insulation, it has been found by the Consolidated Coal Co., Herrin, Ill., eliminates troubles due to cleaning slot insulation from armature cores and stators when rewinds are necessary. The cloth portion—glass cloth—is laid next to the iron ore. This insulating material, states Harry Becker, electrician, may be obtained from most supply houses. It comes in various thicknesses from 10 to 35 mils with a single or double facing of glass cloth. Thickness of the glass cloth is 4 mils.



New board chalks up a local victory and portends a victory for the nation.

How Gulf Lubrication Service Engineers are helping to increase coal production!

No More Cutter Bearings Lost . . . "We were losing cutter bearings weekly before we adopted the lubrication practice recommended by a Gulf Lubrication Service Engineer," says a mine Superintendent. "Since then we haven't lost a bearing in over a year. As a result, we're getting increased production and lower maintenance costs."

★

3-Way Improvement in Loading Efficiency . . . "Our records show a 3-way improvement in loading efficiency by following Gulf Engineering recommendations," says a mine Superintendent. "The proper application of the right Gulf lubricants has resulted in improved loader performance, a big reduction in mechanical delays, and lower maintenance expense."

★

Fewer Replacements of Journal Brasses . . . "Gulf Journal Oil and Gulf Elastic Yarn, as recommended by a Gulf Lubrication Service Engineer, have greatly reduced our replacements of journal brasses," says a shop Foreman. "Gulf Engineering recommendations made possible improved hauling and large savings in maintenance costs."

Improved Loader Operation . . . "The gathering heads of our loaders must operate in extremely wet places," says a Chief Electrician, "and they were giving us all kinds of trouble. A Gulf Lubrication Service Engineer helped us solve our problem by recommending a water-resistant lubricant which provides full protection. Result: continuous loader operation and increased production."

★

Tough Maintenance Problem Licked . . . "The main guides of our shaker screens were being scored and worn out in a short time because of faulty lubrication," says a mine Superintendent. "With a change to the lubricants and application methods recommended by a Gulf Lubrication Service Engineer, the problem was solved, and now we get completely trouble-free service from this equipment."

★

Improved Hauling . . . "By closely following Gulf Engineering recommendations, our mine car wheels run freely in all seasons of the year," says a mine Superintendent. "We are now able to pull more cars and get lower haulage costs."



GULF OIL CORPORATION

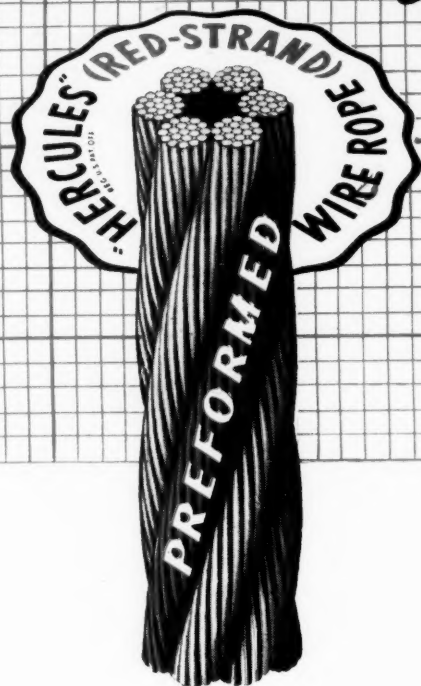
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Call in a Gulf Lubrication
Service Engineer to help
step up your production

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Designed for Saving Steel Time Money



IF YOU will chart the service record of Preformed "HERCULES" (Red-Strand) Wire Rope—as so many have done—you, too, will have definite proof of the savings that its use provides.

You will find a saving in steel because of its longer life; by the same token you also save time, as replacements are less frequent. And the sum of the two savings is greater economy.

The consistent top-flight performance of Preformed "HERCULES" (Red-Strand) Wire Rope is not a matter of chance. Like all wire rope bearing this well-known name, it is made of acid open-hearth steel wire . . . selected by rigid tests to make sure that it meets our exacting requirements. It is then carefully manufactured according to sound fundamental principles.

The more hours of work you can get out of every pound of wire rope you use, the more steel you save for other vital war purposes. Regardless of the kind or make of wire rope you now have, it will not be able to give you the full service of which it is actually capable unless it is handled correctly and operated under proper working conditions. For further information on the proper use, care and application of wire rope, feel free to consult our Engineering Department.

Advantages of Preformed Wire Rope

1
As broken wires lie practically flat, they are not so apt to injure hands of the men handling it. Also, there is less possibility of an "out of place" wire causing damage to adjacent wires in the rope.

2
It is not so easily kinked.

3
Its inert qualities make for smoother spooling and easier handling.

4
The preforming process minimizes the tendency of Lang's Lay wire rope to loop or squirm.

5
There is less turning and twisting of the rope in the grooves, and less internal movement of the wires and strands—all of which tends to reduce both external and internal wear, thereby insuring longer service.

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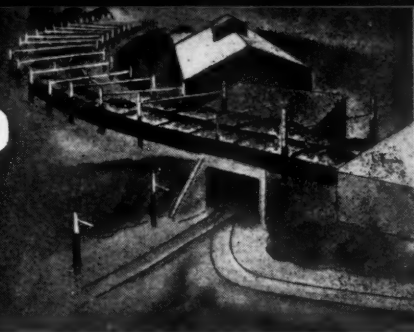


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COAL AGE NEWS ROUNDUP



More Bituminous Mines Adopt Longer Week: Shifting Miners West Asked by WPB

No General Action Taken But a Number of Companies and Districts Sign Agreements to Lengthen Work Week—War Production Board Asks Action on Shifting Miners to the West to Relieve Shortages

SIGNING of additional local agreements to extend the work week by commercial operators and proposals to move miners to the Far West were among manpower developments in bituminous coal mining in January. Meanwhile, Washington struggled to get closer to a solution of the over-all problem of the nation.

Canadian manpower troubles also increased in January, and steps toward solving them included furloughing men from the Army. In British Columbia, it was suggested that small coal operations be closed and the men shifted to "more highly equipped" workings. This proposal was included in a special report before Ottawa manpower and fuel administrations in December. However, sharp issue was taken with this contention by the British Columbia Department of Mines, which said such shifts would cause trouble without an appreciable increase in output.

The Canadian coal-mining shortage was estimated at 6,000 men in November. To help ease the situation, coal miners serving in the Army within the Dominion will be given three-months' leaves of absence to return to the mines. This action was taken at the request of the Selective Service director. The men will be provided with free transportation to their destination and will wear civilian clothes. Their Army pay will be suspended for the period. Employers will be required to provide military authorities with certificates showing that the men given leave actually are working in the mines. Even with this measure and the hiring of some 1,200 unskilled new men, the situation still admittedly was serious.

Solid Fuels Coordinator Ickes again took a hand in the controversy over extending the work week in the United States bituminous mines, but little progress was made on general agreements for the big eastern and southern fields, although some local and district agreements were signed and more were in prospect in January. In identical letters to John L. Lewis, president, United Mine Workers, and Ezra Van Horn, chairman of the Appalachian joint conference, on Dec. 21, he requested early settlement of differences and adoption of the six-day work week, which he had requested Sept. 29.

Expedient action was necessary, said

Mr. Ickes, to assure an adequate supply of bituminous coal to meet growing war and essential civilian requirements. "Obstacles to speedy settlement of this matter, which once were prevented by government regulations covering maximum bituminous coal prices and the rates of pay for increased hours of labor, have been removed. The way is now clear for speedy action and the nation expects it."

In his reply, Mr. Lewis asked that the operators cease quibbling and sign the agreement already accepted by coal-producing subsidiaries of the United States Steel Corp. *Coal Age*, December, 1942, p. 57). For their part, the operators, both northern and southern, declared their willingness to accept the form of the anthracite agreement *Coal Age*, January, 1943, pp. 45, 120), and later asked Lewis to meet with them for this purpose. His reply was: "Replying to your telegram, the United Mine Workers of America will be

Notice to Subscribers

Readers of *Coal Age* will observe that the "trim size" of the current issue of the magazine is slightly smaller than that of previous numbers. The reduction in size has been made to enable to publishers to meet an order of the War Production Board limiting the amount of paper that may be used in 1943. Subscribers will note, however, that no change has been made in size of type or in the amount of editorial content per page, but that a substantial saving in paper has been effected merely by trimming the margins.

The publishers have adopted the new size as a war measure and as a contribution to the conservation of manpower and transportation facilities in the production and distribution of paper. Service to the reader has not been sacrificed and will be maintained as far as humanly possible in the face of the problems confronting all of us in our united efforts to win the war.

glad to grant you the anthracite agreement for any anthracite mines operated by you or your group."

Operators and union representatives finally got together Jan. 6, but adjourned Jan. 8 without reaching an agreement and without setting a date for further meetings. Meanwhile, Jan. 7, the Christopher mining interests signed the UMW agreement for its four mines in northern West Virginia, employing some 2,000 men.

A district agreement was completed Jan. 13 when the Western Pennsylvania Coal Operators' Association signed the same form of agreement. This agreement covers union districts Nos. 3, 4 and 5, with some 75,000 men employed, it is reported. Four mines of the Peabody Coal Co., Taylorville, Ill., also accepted the agreement, according to an announcement Jan. 21.

An agreement covering District 2 was signed Jan. 29 by the Central Pennsylvania and Somerset County coal operators' associations, effective Feb. 6. Meanwhile, OPA announced that maximum prices would be raised to take care of extra costs resulting from overtime operation and other factors, and on Jan. 30 granted an increase of approximately 23c. per ton to western Pennsylvania. Approximately 15c. represents overtime and 8c. represents other cost increases since April, 1942.

January also saw a strike more or less in favor of the six-day week. This occurred at the Bankston Creek Collieries Co., Saline County, Illinois. The miners, members of the Progressive Miners of America, were protesting a system under which, although the mines worked six days per week, the men were staggered so that they worked only five. The stoppage began about the first of the year and it was not until Jan. 15 that the men voted to return while a War Labor Board conciliator attempts to mediate the dispute. Wasson No. 1 miners, in the same county, went out for identical reasons Jan. 20.

Reorganization of the War Manpower Commission and the streamlining of its policies and methods were among the developments on the national labor front in December and January. Divisions, offices and services in WMC were placed under five bureaus in December: placement, training, labor utilization, program planning and control, and selective service. Studies were undertaken to cut down paper work and reports from the field and also to determine how much additional authority could be delegated to regional offices and through them to local offices.

In the field of Selective Service, Occupational Bulletin No. 4 (amended Dec. 15, 1942) was released early in January. This

(May 2, 1942) and an amended list dated May 25, 1942, and lists 53 critical occupations for coal mining, meaning those occupations requiring six months or more of training. Operators noted certain "omissions" in the list, although most were of the opinion that it offered prospects of improvement in obtaining deferments for essential employees.

In spite of these various measures, however, the mining manpower situation still remained critical, as indicated in a resolution adopted by the Solid Fuels Advisory War Council in November but not made public until the end of the year. Declaring that most careful consideration of policies is necessary by the War Manpower Commission and Selective Service, including making sure that such policies are fully followed by local draft boards, the council offered its services in any advisory or data-collecting capacities and asked that the Solid Fuels Coordinator for War intercede with the appropriate government officials.

Absenteeism still continued to plague many segments of the bituminous industry, and additional steps were taken to reduce it and increase output. Early in January, Virginia authorities announced that during the week of Dec. 15 20 per

cent of the Virginia coal miners were absent voluntarily. An additional 6 per cent were absent because of illness or injuries. On the other side of the ledger, some 22 additional mines in Ohio and nine in Pennsylvania had organized Victory Production Committees, according to an announcement late in December.

Operators in the Rocky Mountains and Oregon and Washington were to the fore in complaining of manpower shortages despite the longer work week and permission to work Sundays and holidays. Early in December, the War Manpower Commission moved into Colorado in an attempt to induce idle men in certain districts to take jobs. A more far-reaching move, however, was made Jan. 16, when the War Production Board called on WMC for action on a request by Coordinator Ickes that 2,000 coal miners be sent to Washington, Oregon, Utah, Wyoming, Colorado and New Mexico to relieve a "critical situation." The call followed an appeal to the WPB Labor Requirements Committee by T. J. Thomas, associate deputy coordinator, who stated that it has been necessary to transport coal all the way from Pennsylvania and West Virginia to meet the fuel needs of these states, which he called "stupid and silly."

Bill to Extend Coal Act Introduced: New Price Hearings Scheduled

Amendment of the Bituminous Coal Act of 1937 and its extension for two years plus extra time to the next July 1 after cessation of hostilities is provided for in H. R. 1454, offered by Representative Doughton Jan. 22 and referred to the House Ways and Means Committee, of which he is a member. The bill, it is reported, has been recommended by the Department of the Interior with the knowledge of the Bureau of the Budget.

In addition to other changes in language and provisions, the new bill proposes to amend the old act to permit the administrative agency to make preliminary or temporary orders pending final disposition of petitions for redetermination of costs and increases or decreases in minimum prices. Expiration is placed at July 1 following a period of two years after the cessation of hostilities. Administration is retained in the Department of the Interior. The text of the bill is as follows:

A BILL

To Amend the Bituminous Coal Act of 1937, as Amended, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Sec. 4 II (a) of the Bituminous Coal Act of 1937, as amended (50 Stat. 72; 55 Stat. 134), is amended:

(a) By striking out the first full paragraph, consisting of eight lines, and inserting in lieu thereof a paragraph to read as follows:

"All code members shall file with the statistical bureau of the district in which the coal covered thereby is produced or with the Bituminous Coal Division, as it may determine, such information concerning the preparation, cost, sale and distribution of coal as the Bituminous Coal Division, after consultation with represen-

tatives of the district boards, may find necessary for the administration of the Act. All such information shall be held by the statistical bureau and the Bituminous Coal Division as the confidential records of the code members filing such information."

(b) By inserting in the next to the last sentence of the next to the last paragraph after the words "district board" a comma and the words "consumers' counsel or otherwise."

(c) By inserting in the next to the last paragraph a new sentence immediately prior to the last sentence in the paragraph to read as follows: "Pending final disposition of any petition by a district board or the consumers' counsel or of a proceeding instituted by the Bituminous Coal Division on its own motion for such a redetermination of costs and increase or decrease of minimum prices and upon reasonable showing of the propriety thereof under the provisions of the Act, the Bituminous Coal Division shall make such preliminary or temporary order as in its judgment may be appropriate."

Sec. 2. Sec. 4 II (d) of the Act is amended—

(a) By inserting after the words "consumers' counsel" the words "or any distributor."

(b) By inserting in the fourth line after the word "failure" the words "to take action necessary to effectuate the provisions of this Act or."

(c) By inserting in the seventh line after the word "section" the words "or with the provisions of any order issued by the Bituminous Coal Division pursuant to any section of this Act."

(d) By striking out in lines ten and eleven the words "subsections (b) and (c) of part II of this section" and inserting in lieu thereof the words "the provisions of this Act."

Sec. 3. Sec. 5 (b) of the Act is amended by inserting a new paragraph to follow the third paragraph and to read as follows:

"The Bituminous Coal Division may, after a hearing, with 30 days' written notice to a distributor, upon proof that such distributor has willfully violated the

Keeping Step with Coal Demand

Bituminous Coal Stocks

	Thousands Tons Dec. 1 1942	Net —P. C. Change—	
		From Nov. 1 1942	From Dec. 1 1941
Electric power utilities.	20,361	-0.4	+63.8
Byproduct coke ovens.	11,190	+1.7	+34.4
Steel and rolling mills.	1,157	-6.6	+27.4
Railroads (Class 1)....	13,293	-2.7	+36.7
Other industrials*.....	32,977	+0.8	+59.9
Total.....	78,978	-0.1	+51.8

Bituminous Coal Consumption

	Thousands Tons Nov. 1942	Net —P. C. Change—	
		From Oct. 1942	From Nov. 1941
Electric power utilities.	5,572	-3.7	+0.8
Byproduct coke ovens.	7,333	-2.8	+7.1
Steel and rolling mills.	858	+1.8	-5.9
Railroads (Class 1)....	10,273	-0.1	+17.6
Other industrials*.....	13,674	+2.4	+9.2
Total.....	37,710	-0.2	+9.4

* Includes beehive ovens, coal-gas retorts and cement mills.

Coal Production

Bituminous

Month of December, 1942, net tons	48,400,000
P.c. change from December, 1941..	-0.6
January-December, 1942, net tons.	580,000,000
P.c. change from Jan.-Dec., 1941..	+13.4

Anthracite

Month of December, 1942, net tons	4,611,000
P.c. change from December, 1941..	+8
January-December, 1942, net tons.	59,961,000
P.c. change from Jan.-Dec., 1941..	+6.4

Sales of Domestic Stokers Vs. Oil Burners

	Coal Stokers	Oil Burners
November, 1942.....	1,994	1,904
P.c. change from Nov., 1941..	-88.2	-85.1
January-November, 1942....	81,344	186,580
P.c. change from Jan.-Nov., 1941.....	-55.2	-73.3

Index of Business Activity*

Week ended Jan. 16 (preliminary).....	192.0
P.c. change from month earlier.....	+0.5
P.c. change from year earlier.....	+14.6

* Business Week Jan. 23.

Electric Power Output†

Week ended Jan. 16, kw.-hr.	3,952,479,000
P.c. change from month earlier..	+0.4
P.c. change from year earlier....	+14.5

† Edison Electric Institute.

provision of any applicable order or regulation, make an order directing the distributor to desist from violations of any of the provisions of this Act, the code, and regulations or orders made thereunder, and upon failure of the distributor to comply with such order, the Bituminous Coal Division may apply to the appropriate circuit court of appeals to enforce such order in accordance with the provisions of subsection (c) of Sec. 6."

Sec. 4. Sec. 10 (c) of the Act is amended—

(a) By inserting in the second line after to maintain records."

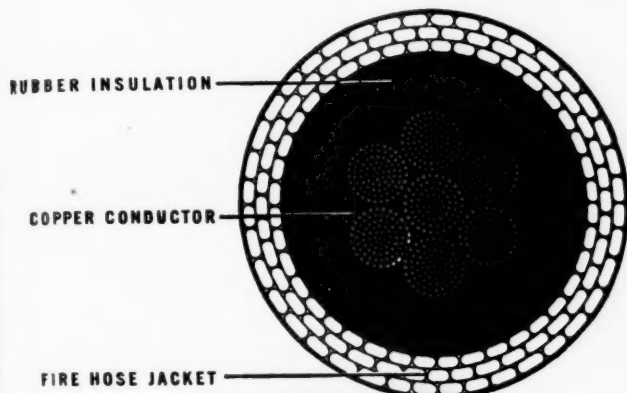
(b) By inserting in the fourth line after the word "default" the words "the Bituminous Coal Division may apply to the United States district court for the district in which the producer resides or transacts business for an order enforcing compliance with the provisions of the Act, code, or regulation made thereunder requiring the filing of such report or data or maintenance of such records; in addition thereto."

Sec. 5. Sec. 17 of the Act is amended by the insertion at the end thereof of a new subsection to read as follows:

"(f) The term 'Bituminous Coal Division' means such division, bureau, or office in the Department of the Interior designated by the Secretary of the Interior to administer under his direction and super-

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with full control of speed and bite*



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COMPARATIVE WEIGHTED AVERAGE PER-TON COSTS, MINIMUM PRICE AREA 1

Docket	No. 21	12 Months, July, 1941-June, 1942*	12 Months, Oct., 1941-Sept., 1942*
District No. 1....	\$2.4242	\$2.4207	\$2.4572
No. 2....	2.2508	2.3091	2.3474
No. 3....	1.9143	1.9731	1.9987
No. 4....	1.9377	1.9555	1.9902
No. 5....	4.2215	4.2418	4.1550
No. 6....	1.8907	2.0437	2.0293
No. 7....	2.4055	2.5265	2.5758
No. 8....	2.2521	2.3001	2.3353
Total, Area 1	\$2.2503	\$2.2972	\$2.3339

* Preliminary compilations from producers' reports. Covers only mines with capacities of 50 tons or more daily.

vision the functions of the National Bituminous Coal Commission and its members which were transferred by Reorganization Plan Numbered II (53 Stat. 1431, 1433) to the Secretary of the Interior to be administered under his direction and supervision by such division, bureau, or office in the Department of the Interior as the Secretary might determine."

Sec. 6: Sec. 19 of the Act, as amended by the Act of April 11, 1941 (55 Stat. 134), is further amended by striking out the words "April 26, 1943," and inserting in lieu thereof the words "of the first day of July following the expiration of a period of two years from the date upon which the President by proclamation or the Congress by concurrent resolution declares that hostilities in the present war have terminated."

Sec. 7. Sec. 3527 of the Internal Revenue Code, as amended by the Act of April 11, 1941 (55 Stat. 134), is further amended by striking out the words "after April 25, 1943," and inserting after the words "bituminous coal" the words "after the 30th day of June following the expiration of a period of two years from the date upon which the President by proclamation or the Congress by concurrent resolution declares that hostilities in the present war have terminated."

In a move which some felt might herald an industry-wide price hearing, the Bituminous Coal Division Jan. 9 ordered a hearing in Docket A-1737, a petition by District Producers' Boards 7 and 8 for an increase in minimum prices. The order followed a preliminary cost-revision conference on Dec. 17, 1942, between the staff of the Division and representatives of the district boards in Price Areas 1, 2 and 3, the Consumers' Counsel and the American Coal Sales Association to consider changes in costs since the determinations in General Docket No. 21, and also how soon a cost- and price-revision proceeding could be embarked upon and whether it should be confined to the Boards 7 and 8 petition or broadened to take in the entire country.

The hearing in A-1737 was set for Feb. 24 and the order and accompanying Statement No. 89 by BCD Director Dan H. Wheeler apparently left the door open for a general price hearing, although the order and statement dealt primarily with cost redetermination in Minimum Price Area 1. Thus, the concluding paragraph states:

"The matter concerned herewith is (a) the determination of the extent, if any, to which there has been a change in excess of 2c. per net ton in the weighted average of the total costs heretofore determined by the Division in General Docket No. 21 for Minimum Price Area

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BITUMINOUS COAL DIVISION WEIGHTED AVERAGE PER TON COSTS OF BITUMINOUS COAL

Price Area and District	Jan.-June, 1942	July-Sept., 1942
Dist. 1: Cent. Pa., Md. and part No. W. Va.	\$2.4694	\$2.5014
Dist. 2: West. Pa.	2.3456	2.3806
Dist. 3: No. W. Va.	1.9918	2.0319
Dist. 4: Ohio.	1.9966	2.0249
Dist. 5: Michigan.	4.3628	4.2511
Dist. 6: W. Va. Pan-handle.	2.0466	2.0671
Dist. 7: So. W. Va. and Va. Smokeless.	2.5670	2.6060
Dist. 8: So. W. Va., E. Ky., part Va. and Tenn.	2.3202	2.3566
Price Area No. 1.	2.3284	2.3614
Dist. 9: W. Ky.	1.5725	1.5838
Dist. 10: Illinois.	1.7214	1.7206
Dist. 11: Indiana.	1.5800	1.5693
Dist. 12: Iowa.	2.8465	2.9005
Price Area 2.	1.6958	1.6924
Dist. 13: Alabama —Price Area 3.	2.8949	3.0169
Dist. 14: Ark.-Okla. —Price Area 4.	3.7419	3.7958
Dist. 15: Mo., Kan., Okla. field—Price Area 5.	2.0941	2.0109
Dist. 16: No. Colo.	2.5207	2.7494
Dist. 17: W. and So. Colo.—No. N. M.	2.8586	2.8473
Dist. 18: Ariz.—N. M.	3.5130	3.6874
Price Area 6.	2.8087	2.8818
Dist. 19: Wyo., Idaho.	1.9797	2.0789
Dist. 20: Utah.	2.1677	2.3105
Price Area 7.	2.0570	2.1714
Dist. 22: Montana—Price Area 9.	1.3897	1.4188
Dist. 23: Wash., Ore.—Price Area 10.	3.7860	3.9917

1, and (b) the making of such revision of the effective minimum prices as may be required in Minimum Price Area 1 or any other minimum-price area by reason of any such changes in the costs for the coals produced in Minimum Price Area 1, and in order to assure that the effective minimum prices established herein (1) will return a realization which approximates the weighted average of the total costs for Minimum Price Area 1, and (2) also comply in other respects with the standards of Sec. 4 II (a) and (b) of the Act."

In a preceding paragraph, it was stated that notice was being given to all producers' boards, all code members, Consumers' Counsel and other persons with an interest in the matter. Cost changes on which the Division based its decision for a rehearing are shown in an accompanying table. A second table shows relative costs for all districts and minimum-price areas separately released by the Division in the concluding months of 1942.

British Launch Research Plan To Develop Coal Uses

A £1,000,000 project for research to develop the uses of coal, one of the most ambitious cooperative schemes ever undertaken by industry in any country for the development of a national asset, was announced by Sir Evan Williams in his presidential address to the British Coal Utilization Research Association, in London, Dec. 17. The project, which will make the association the largest industrial research association in Great Britain, will

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No need for an air hammer to drill this rock roof in West Virginia

Note ease and sure handling of driller

Light weight COALMASTERS are quicker and less tiresome to handle. Excess weight is a burden when handled 100 to 200 times a day.

Their *rigid conveyor type* drills straight holes without choking and cleans them clean without scraping—a complete operation eliminated only by COALMASTER tools.

By this *system of clean hole drilling* the augers are pulled and changed quickly—no fuss or fighting the equipment to get the work done.

Accurate alignment of COALMASTER tools from thread bar to tool point enables them to run smoothly and to give the driller time to relax while the drill

does the work. Why throw vibration into your driller and tire him unnecessarily when COALMASTER tools will take it out of the drill?

The COALMASTER patented *system of staggered tooth bit positioning* starts and drills holes quickly and easily. The coal is broken up and ripped out—not pulverized. To the driller it is simply a matter of flipping the switch.

Because of the *ball bearing safety thread bar socket* your driller spends one dollar for gloves where he formerly spent three—he can't get them caught in this socket when he pulls off the thread bar while still turning.

★ A COALMASTER Matched Set is a set of tools complete from drill to drill point. Each item in the set is designed to coordinate with other tools in the set and collectively do a certain type of drilling job exceedingly well.

Our representatives are drilling specialists—men trained by experience to select the tools that will meet your particular requirements best. They are all anxious to help you solve your drilling problems.

COALMASTER

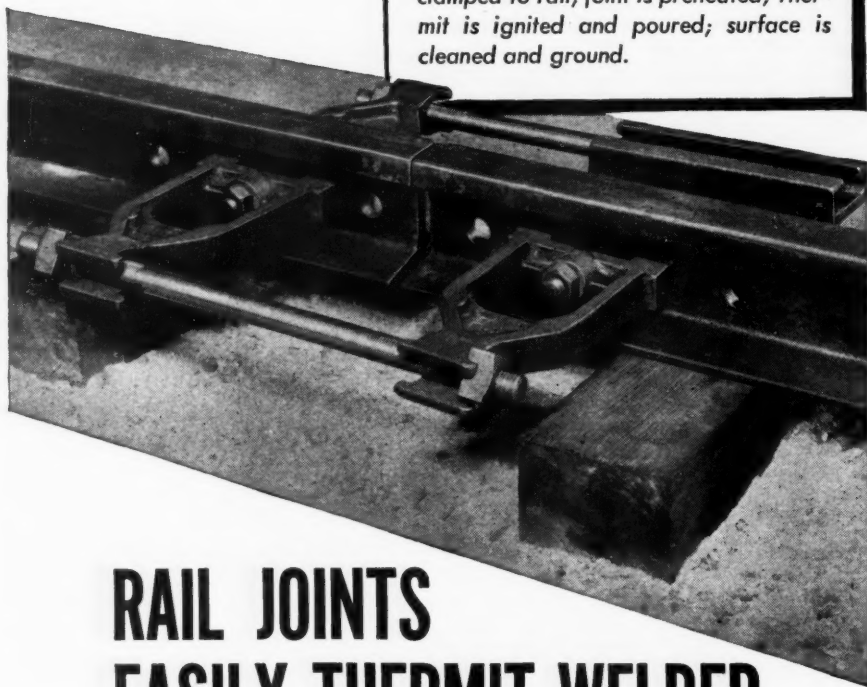
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DRILLING**

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Shows rail ends lined up and clamped: one step in a critical-material-saving Thermit weld. Molds are then rammed and clamped to rail; joint is preheated; Thermit is ignited and poured; surface is cleaned and ground.



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Power losses at joints are eliminated, since a Thermit welded joint has the same conductivity as the rail itself.

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be financed by the coal industry and the government, with full support of manufacturers of plant and equipment for using coal.

In the use of coal as a raw material the organization set for itself these objectives: (1) to improve existing coal-treatment processes, such as carbonization, so as to increase the yield of valuable products and to enable a wider range of coals to be used; (2) to show how to produce from coal the stock materials of the chemical industry, such as alcohols, acids, saturated and unsaturated hydrocarbons, etc.; (3) to produce directly from coal, without breaking up its structure, materials of industrial value; (4) to produce liquid fuels from coal.

The project is the outgrowth of proposals presented before the Department of Scientific and Industrial Research for expanding the association's scale of operations. The department responded with the offer of a grant which with government assistance would assure the association an income of £200,000 a year for the next five years to carry out its program for central research to develop better uses of coal.

29 Anthracite Firms Indicted On Charges of Price Fixing

Twenty-nine anthracite companies and 26 of their officers and employees were indicted Jan. 6 by a Federal grand jury in the U. S. District Court at New York City on a charge of violating the Sherman anti-trust act by fixing prices. The indictment, which was handed up to Judge William Bond, alleges that from 1939 until the spring of 1942 the defendants held, attended or were represented at meetings held periodically in New York City at which trade practices, discounts and circular prices and the effective dates of the prices were agreed upon. It also was charged that a system of policing was established to maintain the circular prices.

The investigation from which the indictments resulted was conducted by Joseph T. Quinnan, Edward J. Carrington, Nelson A. Scharfman and Armand F. MacManus, special attorneys for the Department of Justice in the New York office of the anti-trust division.

Named as defendants were the following:

Glen Alden Coal Co., Delaware, Lackawanna & Western Coal Co., Charles F. Huber, chairman of the board of both companies, and Gordon C. Cooke, president of D. L. & W.

Susquehanna Collieries Co., M. A. Hanna Co., James Prendergast, president, Susquehanna, and vice president, Hanna; Chauncey W. Stone, general sales agent, Hanna.

Pennsylvania Coal Co., Pattison & Bowns, Inc.; Harry J. Connelly, president and general manager, P.C.C., and William Gohl, president, Pattison & Bowns.

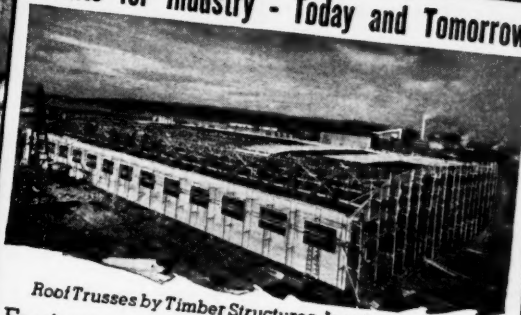
Lehigh Navigation Coal Co., Inc.; Jesse B. Warriner, president, and Walter L. Banta, vice president and general sales manager.

Philadelphia & Reading Coal & Iron Co.; Ralph E. Taggart, president, and Joseph T. Berta, sales manager.

Lehigh Valley Coal Co., Lehigh Valley Coal Sales Co.; Lewis R. Close, president of both companies, and Arch E. Sloat, vice

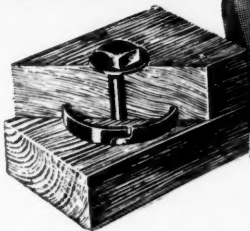
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Roof Trusses by Timber Structures, Inc., Portland, Ore.

Engineers, Architects, Designers, Builders in every field of industry now are using engineered timber for heavy duty structures. The TECO Timber Connector System made this possible. You, too, can design in timber with TECO. Write for our literature today.



The TECO Ring Connector spreads the load on a timber joint over practically the entire cross-section of the wood . . . brings the full structural strength of lumber into play.

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Modern mining demands the best materials, workmanship and design in track work. West Virginia builds high grade, modern track work and their Engineers are glad to give you obligation free consultation service.

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Edison Anthracite Coal Co.

Moffat Coal Co.; R. Y. Moffat, president.

Jermyn-Green Coal Co.; William S. Jermyn, president.

Locust Coal Co.

Mineral Spring Coal Co., No. 9 Coal Co., Sullivan Trail Coal Co.; Louis Pagnotti,

treasurer and general manager, Mineral Spring; president, No. 9, and president and general manager, Sullivan Trail.

Payne Coal Co., Inc.

Penn Anthracite Collieries Co.

Pompey Coal Co.

Russell Mining Co.

Stevens Coal Co.

Volpe Coal Co.

William Penn Colliery Co.

Jeddo-Highland Coal Co.

Weston Dodson & Co., Inc.

Pleas of not guilty were entered by the defendants in federal court on Jan. 18, and Judge Bondy set bail of \$1,000 each for the individuals and set March 1 for the fixing of a trial date.

The Philadelphia & Reading company filed a petition in the U. S. District Court at Philadelphia Jan. 15 charging that Thurman Arnold, Assistant U. S. Attorney General, violated an order by the federal court in Philadelphia when he had the company and two of its officers indicted on the anti-trust charges. Mr. Arnold's action, the company charged, violated a court order enjoining "all persons from instituting and prosecuting or continuing the prosecution of any actions" against the company. The petition was granted by Federal Judge William H. Kirkpatrick.

Commenting on the indictments, Walter Gordon Merritt, counsel for the anthracite industry, stated: "The anthracite industry is attacked for price fixing during the period of war effort when custody of the public interests has been taken out of private hands and placed under the wing of OPA, which has fixed anthracite prices since September, 1941. Today, at the very moment when the industry is attacked, OPA has raised anthracite prices to keep the industry alive. For years, prior to the time when OPA undertook price fixing, the industry was subsidizing the buyers of anthracite by selling below cost. Half of its capital was thus dissipated. This new anti-trust case should be entitled 'United States vs. Santa Claus.'"

Chemical Use of Coal in 1943 Over 100,000,000 Tons

"Coal, one of Nature's most common raw materials, is potentially richer in rubbers than all of the islands of the East; more bountiful in fibers than all the Japanese silk worms; wealthier in colors than the rainbows; and abounding in curative medicinals," declares E. I. duPont de Nemours & Co., Inc.

"Known to most as fuel, coal is scarcely appreciated, except by a few, as an almost inexhaustible storehouse of chemicals from which are synthesized many materials essential both in peace and war—



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COMPOUND M

The cost? . . . about ½ cent per ton of coal mined

COMPOUND M is the champion "skeet-shooter" of the coal wetting agents. Hit a cloud of coal dust with this effective chemical and particles drop like clay pigeons . . . and they stay put for a long time, for COMPOUND M has exceptionally long life and penetrating power. It forms a coating to retard evaporation of moisture.

Many prominent operators are now

protecting their men, their property and their production by spraying COMPOUND M at all points where dust might arise. They spray continuously at the face, loaders and dumpers; at intervals along haulageways.

There is no better way of combining effectiveness and economy of dust-allaying than with COMPOUND M.



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THE *KINK* THAT RUINED THIS MINE CABLE!

TAKE A GOOD LOOK at that ugly mug on the poster. He's the saboteur that's responsible for all the kinks that damage your cables, shorten their lives. Learn to recognize him now. When you find this loop or one of his buddies in your cables, be careful. If pulled through, it will become a kink, ruining that section of your cable. To remove it properly, the cable must be slacked and doubled back on itself. Better still, don't let it form at all. Handle your cables carefully at all times.

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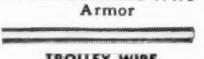
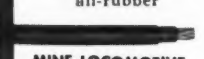





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 MINE LOCOMOTIVE REEL CABLE Loom sheath or all-rubber	 ARMATURE AND FIELD COILS For Motor Repair

KINKS AREN'T THE ONLY DANGER TO CABLES!

GINKS are dangerous, too—even more than kinks because they cause more kinds of damage. A gink is a guy that mistreats his equipment—kinks his cables, trails them through water, lets them dangle across tracks to be run over by cars and locomotives... Proceed. Then we can become ginks, too!

DON'T BE A GINK—DON'T MAKE A KINK! BE CAREFUL ALWAYS!

Coming Meetings

- American Institute of Mining and Metallurgical Engineers; annual meeting, Feb. 14-18, Engineering Societies Building, New York City.
- Mine Inspectors' Institute; annual meeting, May 24, 25 and 26, Deshler-Wallick Hotel, Columbus, Ohio.

materials which formerly had to be imported. Upward of 100,000,000 tons of coal will be chemically utilized in 1943," duPont estimates.

"In ordinary bituminous coal," it is pointed out, "there are constituents of explosives for bombs, shells and torpedoes, plastics of many types including those of crystal clarity; solvents, food preservatives, insecticides, fertilizers, lacquers, 'soapless soaps,' literally hundreds of things vital to total war. Coal is not poured into some giant bubbling test tube, over which a white-robed chemist waves a wand and adds air and water at intervals, and out of which comes neoprene synthetic rubber, nylon, fast dyes, TNT, light crystal-clear plastics and sulfapyradine. It's not that simple. 'Made from coal' really means that one of several intermediates used in making a product is in turn made from one or more of the several derivatives of coal.

Coal Much Studied

"Since William Perkin, a young British chemist, made the first 'coal-tar dye' 87 years ago, chemists and engineers have expended untold energy, initiative, imagination and funds in probing the chemicals derived from coal and in developing the processes and equipment necessary to their manufacture into useful products.

"Bituminous coal heated in an inclosed vessel gives off volatile products and leaves coke as a residue. Both coke and the volatile products—such as coal gas, ammonia, benzol and toluol—today are used by duPont and others to make war necessities for many of which we formerly depended on foreign countries.

"About 1.1 lb. of coal, for example, is chemically utilized to make each pound of neoprene, America's first satisfactory synthetic rubber-like material. Neoprene is so strategic in our war effort that it was one of seven materials, and the only non-metal, placed on the original priority list in 1941. Today it is carefully apportioned for tires on military vehicles, barrage balloons, airplane parts, shipboard cables to protect ships against certain mines, and other necessities. This child of coal is more than a synthetic rubber; it is a material containing rubber's desirable qualities and, in addition, superior properties of its own.

"Nylon is derived from coal, air and water. Having higher combined strength and elasticity than any natural fiber, it has been used only for military purposes since February, 1942. Parachutes and canopy cloth, tapes, shroud lines and certain parts of the harness webbing and belting for parachutes take great quan-

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SEALTITE Tamping Bags offer a safer, faster, cheaper, method of sealing shots. Properly tamped holes will cut powder costs and help your blasting crew in bringing down falls. Investigate now—see why they are so widely used.



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MINING CATALOGS FOR THIS INDEX

—one of seven sections in
this handy, useful catalog.

Section 2 Cutting — Drilling — Shooting and Stripping

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(See listing above for page numbers)

Best, Powder

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Bits, Mining Machine Cutter

Bowditch Co.

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Cable, Mining Machine

American Steel & Wire Co.

Hazard Insulated Wire Works

Div. of Chromic Co.

Car, Hand Dump

Austin Western Road Machinery

Co.

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COAL MINING CATALOGS, 330 West 42nd St., New York, N. Y.

C.A., Feb., '42

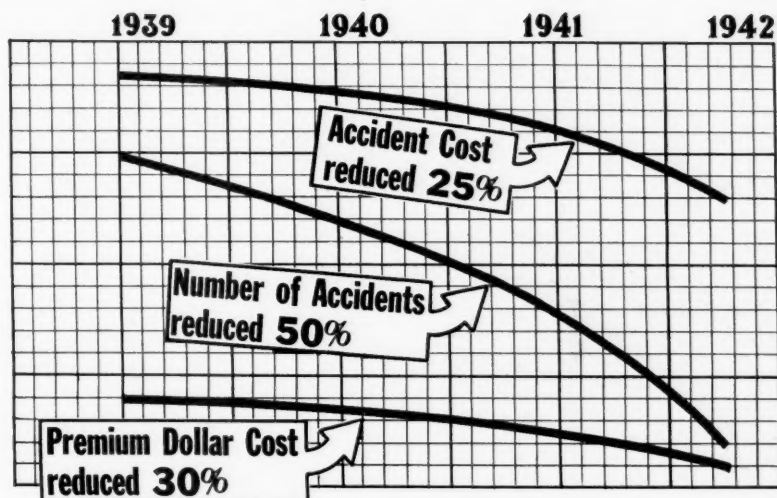
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This mine owner is now enjoying the benefits, in dollars and cents, of Bituminous Casualty service. We began writing his Workmen's Compensation in 1939. Our safety engineers inspected the mine, made recommendations in the interests of production as well as safety. He cooperated.

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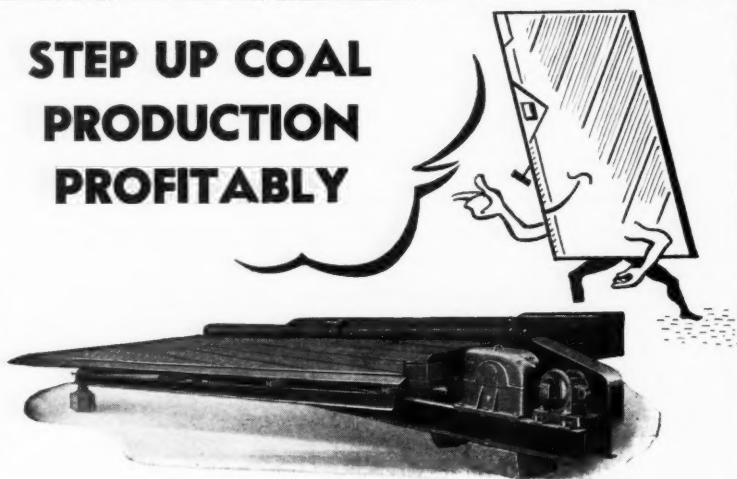
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Coal is vital to our war effort. Step up your coal production with Super-Duty Diagonal Deck Coal Washing Tables responsible for your preparation. The extra riffles and separation area of Super-Duty Tables afford larger savings in recoveries . . . increase daily washed coal output . . . minimize wasteful losses. Save valuable time and labor and definitely increase production with Super-Duty Tables.

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ties. Nylon rope is superior to any fiber rope on a basis of strength, lightness and durability. Exceptionally tough tire cords of this synthetic now are made experimentally. Tapered paint-brush bristles, the first satisfactory ones ever made by man, and bristles for essential industrial and toilet brushes are nylon. They replace natural bristle, formerly imported from the Far East. All nylon is needed for war now, but with peace there will come not only sheer stockings but a host of new products fashioned from this versatile member of coal's family.

"Although Perkin fashioned the first crude coal-tar dye in 1856, America still was importing more than 90 percent of all its colors when World War I started. Our infant dye industry of 1918 now is a vigorous adult, furnishing to our armed forces fast dyes that will stand up under severe weathering and repeated washings. These dyes help to make our fighters the best dressed in history and help camouflage man and munitions. From the work of duPont and others with coal-tar dyes, beginning in the period 1914-18, has sprung the organic chemicals industry in which ordinary coal is one of the indispensable raw materials.

"The pharmaceutical industry is to a large degree predicated upon coal-tar chemicals. The new sulfa drugs are an outstanding example. Among the most notable and helpful contributions to medicine in a century, today they are invaluable aids in decreasing fatalities among those injured in war. Their use on burns at Pearl Harbor, against gangrene in wounds, and against epidemics of pneumonia and other diseases has been of incalculable importance. Atabrine, vital substitute for quinine in treating malaria, is another coal-tar derivative. Improved antiseptics and anaesthetics also are made with coal-tar chemicals.

"'Lucite,' methyl methacrylate resin, the crystal-clear plastic for transparent portions of military airplanes, stems from black coal. This is only one of the light but strong plastics, of which so much is expected, that comes from coal and its derivatives. Another is polyvinyl butyral, formerly the plastic interlayer in laminated safety glass for automobiles but now the coating for Army raincoats, hospital sheeting, drinking-water bags and other war

Bureau of Mines Approvals

Three approvals of permissible equipment were issued by the U. S. Bureau of Mines in December, as follows:

Sullivan Machinery Co.—Type T-19 air compressor; two motors, 5 and 25 hp., 230 and 550 volts, d.c.; approvals 465 and 465A; Dec. 12.

Joy Mfg. Co.—Type PL-11 5PE/F elevating conveyor; 7½-hp. motor, 250 and 500 volts, d.c.; approvals 466 and 466A; Dec. 15.

Goodman Mfg. Co.—Types G-12½ and GS-12½ shaker conveyor; 10-hp. motor, 230 and 550 volts, d.c.; approvals 467 and 467A; Dec. 29.

products. This plastic is replacing tons of precious crude rubber.

"Originating in bituminous coal also are the phenol-formaldehyde and the urea-formaldehyde plastics. These plastics' war roles range from adhesives on plywood trainer planes and torpedo boats to soldiers' bugles; from insulation on electric wiring to gunstocks and radio antennas on airplanes.

"Military explosives utilize coal. Toluol, an ingredient of powerful TNT for shells, bombs and torpedoes, comes either from coal or petroleum. Methanol, derived from coal, is a necessary raw material for the manufacture of certain military explosives, and coal is the source of aniline, needed for making the tetryl used as a 'booster' in high-explosive shells.

"Long is the list of products partially or wholly derivable from coal and essential in the war. It includes:

"Solvents, such as trichlorethylene, now used to clean metal parts of ordnance quickly and efficiently, and formerly available as odorless, non-flammable dry-cleaning fluids.

"Anti-freeze to protect the motors of airplanes, tanks and trucks the world around, and of automobiles and trucks needed on the home front.

"Flotation agents which lift invaluable copper, zinc, lead, nickel, tungsten, chromium and other strategic metals from low-grade ore deposits once disregarded.

"Zelan," durable water-repellent textile finish, which remains effective on Army field jackets, sky-troop uniforms and other military clothing despite weathering and repeated laundering.

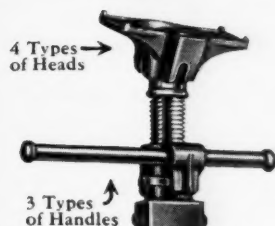
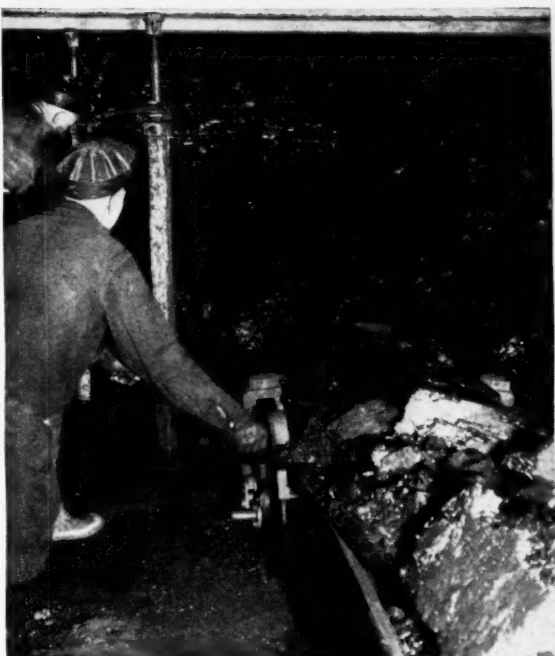
"A new flameproofing agent—ammonium sulfamate—used to treat clothes



Some of the hazards of improperly drilled and improperly plugged wells are illustrated in this photo submitted by Driscoll O. Scanlan, Illinois State mine inspector. This well was drilled for oil through abandoned workings of the Glen Ridge mine of the Marion County Coal Mining Corp., Centralia, Ill. The well was improperly cemented at the time of drilling and abandoned without plugging. In 16 months, salt water had eaten through the pipe, letting water into the mine. The well also made 3 to 4 percent gas.

STRONGER...SAFER...EASIER OPERATING

The DUFF-NORTON MINE ROOF JACK



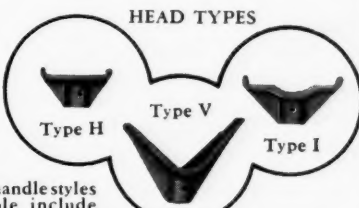
Extra Strong Thick Wall Tube

Bright Chrome Yellow Color

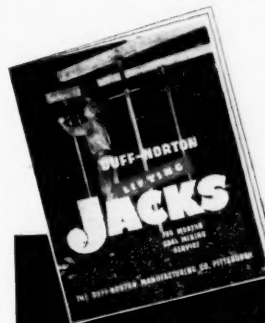
Rounded Corners

Strong Welded-Steel Base

● The Duff-Norton Mine Roof Jack is a great time and labor saving device for efficient mine roof support. Stronger, safer, easier operating, it can be quickly spotted wherever needed. Experienced mining men everywhere know and appreciate this Mine Roof Jack's increased size, thicker tubing, larger screw and variety of head and handle styles to meet your requirements.



Three handle styles available include the Wing Nut and Drop types, above, and the slide type shown on jack. The head types include the three styles, above, as well as the Ball and Socket type illustrated on the jack.



Write

FOR BULLETIN. Ask your Distributor for a copy of the Mine Roof Jack Bulletin giving sizes, ratings and prices of the Duff-Norton Mine Roof Jack and other Duff-Norton Mining Jacks. If he hasn't a copy, we'll be glad to send you one by return mail.

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"Save Bullet-Metal for Our Boys' Guns ... with a FIST-GRIP on Wire Rope"



"YOU can save rope, save clips — just as we do — by using Laughlin 'Fist-Grip' Safety Clips, instead of 'finger-pinch' U-bolt clips that crimp and injure wire rope.

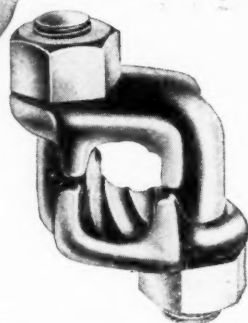
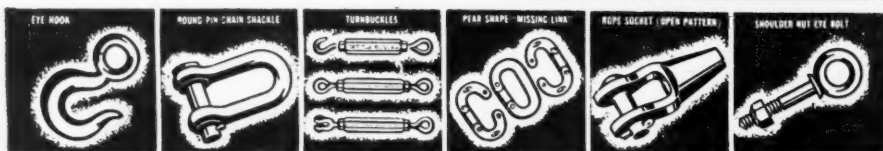
"With 'Fist-Grip' Clips the bolts are on opposite sides — the four bearing surfaces grip like a fist, not a 'finger-pinch'. Three 'Fist-Grip' Clips do the work of four U-bolts! Design is so strong that less steel is needed in each clip. **25% less steel** in all is saved per assembly.

"I figure the rope, clips and steel saved mean more guns and bullets for our boys."

Competitive Tests Prove Greater Holding Power of Laughlin "Fist-Grip" Clips

With 4 U-bolt clips at 37,750 lbs. load, $\frac{3}{4}$ " rope broke at saddle, while only 3 Laughlin Safety Clips held the same load without rope breakage, because extra bearing surfaces grip without crimping. Here's the clip that fights for your country! Investigate!

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YOU can save manpower and metals with the "FIST-GRIP" CLIP

Saves Manpower

greater holding power, less work; can't be put on wrong.

Saves Metals

no special-shaped wrench, fewer clips needed, no spoiled rope, 25% less steel.

**THE THOMAS
LAUGHLIN
Company
PORTLAND, MAINE**

of workers in munitions and aircraft factories and foundries, and also to flame-proof insulating materials on ship's cables.

"Acetate rayon, a useful war fabric, is made from cellulose and vital acetic acid, now derivable from coal. Lacquers, mildew inhibitors, leather cloth, moth repellents, fluids for hydraulic brakes, gum inhibitors for gasoline, wetting agents to facilitate scouring, bleaching and dyeing operations, such are the diversity of products originating in coal.

"Coal has been known for over 2,000 years, having been used by blacksmiths of Greece and Italy some 300 years before Christ. But its values as a chemical storehouse have been exploited less than 100 years. Its full chemical possibilities are yet to be realized. The stress of war has accelerated greatly the investigation of coal as a chemical raw material. Out of that intense research will come new chemicals-from-coal for the better world envisioned after hostilities cease."

Operator Fined for Negligence In Alberta Disaster

Brazeau Collieries, Ltd., was fined \$5,000 Jan. 15 in Alberta Supreme Court, at Calgary, by Chief Justice W. C. Ives, who found the company guilty on a charge of criminal negligence following an explosion at its Nordegg mine Oct. 31, 1941, in which 29 miners lost their lives. The decision held that ventilation provided had been inadequate to overcome a gaseous condition and to render the mine safe for workers.

Personal Notes

BEN A. ADAMS, section foreman at the Hemphill mine of the Elk Horn Coal Corp., Jackhorn, Ky., has been named general mine foreman of the company.

L. C. ANDERSON has been made general purchasing agent for the Kenmont Coal Corp., Jeff, Ky. Besides heading the merchandise department he will purchase all equipment and mining machinery.

MART BAILEY has been advanced to general mine foreman for the Utilities Elkhorn Coal Co., Esco, Ky.

C. M. BAKER, formerly mining engineer with Republic Steel Co., is now a member of the engineering staff of the Tennessee Coal, Iron & Railroad Co. in Alabama.

THOMAS L. BALL has been promoted from the engineering department of the Alabama By-Products Corp. to superintendent of the Colta mine, Flat Creek, Ala., vice Benjamin H. Purser, deceased. Mr. Ball previously was connected with several of the coal mining companies of the Birmingham district.

JOHN W. BUCH, former assistant professor in the department of mining engineering, Pennsylvania State College, has been named chief of the Coal Economics Division of the Bureau of Mines. A native of Massillon, Ohio, Mr. Buch was grad-



John W. Buch

uated from Ohio State University in mining engineering in 1923. Entering the employ of the Hudson Coal Co. at Scranton, Pa., in 1925, he made production forecasts in the anthracite field and then was assigned to study equipment, mining methods and economics of production of bituminous coal and metal mines and the possibility of adapting developments in these industries to the anthracite field. This work took him to mines in central Pennsylvania, Indiana, Illinois, Tennessee, and Michigan. In 1938 he joined the faculty of Pennsylvania State College. That year he also received his degree of Engineer of Mines from Ohio State University. In 1941 he won the degree of Master of Science at Pennsylvania State College.

R. V. CLAY, vice-president, Hanna Coal Co., has been placed in charge of operations at Bradley Nos. 1 and 2 mines, Bradley, Ohio, recently bought from the United States Coal Co.

EDWIN C. CURTIS, head of the Ninth anthracite inspection district of Pennsylvania since 1916, has been transferred to the 12th district, vice David T. Davis, resigned.

EARL DITTY is a new mine foreman for the Utilities Elkhorn Coal Co., Esco, Ky. Mr. Ditty had former connections with coal companies in the West Virginia field.

W. H. DOSSETT, assistant mine foreman at No. 8 mine of the Tennessee Coal, Iron & Railroad Co., Wylam, Ala., has been appointed mine foreman at that operation.

JOHN D. EDWARDS, Wyoming, Pa., has been appointed an inspector and assigned to the Ninth anthracite district, vice Edwin C. Curtis, transferred.

L. F. ELLIS, formerly of Knoxville, Tenn., has become mine foreman for the Acorn Coal Co., Blackey, Ky., in the Hazard field. He was connected with the Blue Diamond Coal Co. several years ago.

GENE GOTTSCHALK, mechanical engineer, lately employed in the New Ray-

HOW TO USE DU PONT "VENTUBE"*

for greater efficiency and faster production
at the working face

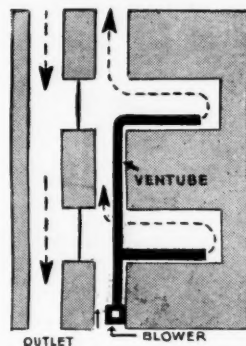
UP-TO-DATE NOTES ON "VENTUBE" INSTALLATION

DU PONT "Ventube" flexible rubberized duct speeds coal production by clearing the working face. With other good mining tools, "Ventube" will help reach that goal of 650 million tons in 1943, urgently needed under our War Program. Check your "Ventube" system, or the one you are considering, against the following points on installing it for peak efficiency.

1. Suspend "Ventube" on messenger wire, No. 9 gauge or larger, strung from roof, walls or timbers. Place posts, or drill short holes into roof or walls to admit pegs for its support. Suspended, "Ventube" is out of haulage way and removed from possible damage.



2. Set supporting pegs, or posts, not over 20 feet apart, for even course line and minimum air friction. Staple "Ventube" mounting wire to pegs or posts, and draw taut.



3. Place air blowers directly in fresh air intake—15 feet or more upstream from the last crosscut, so as to avoid recirculating bad air returning from the working faces to the main current.

4. Sweep two or more working faces by using "Ventube" Y or T fittings. These split the air course into two lines, and permit use of single fans of good air supply for multiple systems, thus saving lengths of "Ventube" for other use.

5. Installed as above, attached to a fan of adequate air capacity with permissible motor, "Ventube" sweeps the working face with clean, fresh air. It helps remove dust and bad air . . . reduces the shooting-loading time cycle . . . safeguards health and steady efficiency of employees. "Ventube" is compact, easily portable—pushes back on itself during blasting. Its sturdy fabric construction, coated and impregnated with a special abrasion-resistant compound, enables it to resist heat, moisture, gases, dry-rot, mildew fungus, acid and alkaline waters.

E. I. du Pont de Nemours & Co. (Inc.), "Fabrikoid" Division, Fairfield, Conn.

"Ventube" is Du Pont's registered trade mark for its flexible, rubberized ventilating duct.



NOTE: For the duration of the War, "Ventube" can be supplied only to the extent that raw materials for its manufacture are made available in accord with regulations issued by the War Production Board. But if you have adequate priority, write now for complete information on this valuable tool of mechanized production.

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STANDARD Ahlberg (CJB) Ball Bearings, Ball Bearing Pillow Blocks and Bower "Super-Finished" Roller Bearings suit practically all application requirements.

Whether you use them in new machines or to modernize existing equipment, you will find that these anti-friction units meet today's demands for new high speeds and dependability with economy and efficiency.

Ahlberg (CJB) Ball Bearings have large balls and deep-grooved rings for extra capacity, mirror-finish surfaces for smooth performance. Mounted units have sturdy housings, improved seals, better alignment features. Bower Roller Bearing raceways are "Super-Finished" to 3-millionths-of-an-inch accuracy for permanent close adjustment and quiet operation.

Ahlberg All-Bearing Service is complete and convenient—made available through leading supply houses and 20 Factory Branches which carry stocks and provide engineering help.

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mond mine of the Raymond City Coal & Transportation Corp., Cedar Grove, W. Va., has left for Fort Hayes, Columbus, Ohio. From there he will be sent to Yale University to attend the Army air force technical command school recently established there. He was graduated from the Missouri School of Mines last year, soon thereafter joining the Air Force Enlisted Reserve.

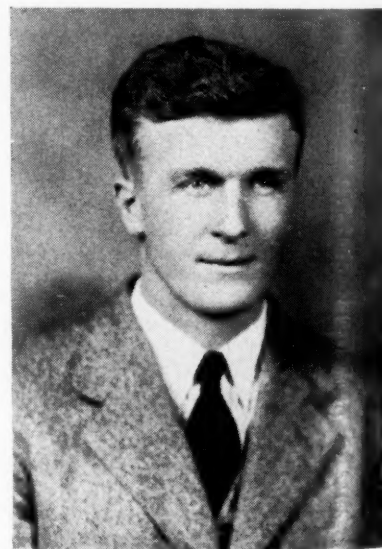
JAMES C. GRAY, chief inspector and superintendent of industrial relations for the Tennessee Coal, Iron & Railroad Co.'s coal mines, Pratt City, Ala., has been promoted to general superintendent of coal mines, vice R. E. Kirk, appointed assistant to vice-president in charge of raw materials. A graduate of Pennsylvania State College, Mr. Gray has been with the company since 1937, prior to which he served twelve years with the Hudson Coal Co.

W. F. HALEY, formerly assistant electrical and maintenance engineer, Consolidation Coal Co., Fairmont, W. Va., has accepted a position as electrical engineer with the Mine Safety Appliances Co., Pittsburgh, Pa.

JOHN C. HAMMEL, for many years purchasing agent of stores of the Blue Diamond Coal Co., Blue Diamond, Ky., has been promoted to general purchasing agent of his company. Besides handling merchandise he will be head of purchasing of machinery and supplies of all kinds.

J. N. HEDDING has resigned as superintendent of the Warwick mine, Duquesne Light Co., Greensboro, Pa., to accept the position of superintendent of the Nemaquin mine, Buckeye Coal Co., Nemaquin, Pa.

MATTHEW J. HREBAR has resigned his position with the Joy Mfg. Co., Franklin, Pa., to accept an appointment as instructor in mining at the Pennsylvania State College, State College, Pa. He is a graduate of Penn State, class of 1941. Prior to graduation he spent approximately five years in coal-mine work in central and western Pennsylvania, during which time he worked as a miner, motorman, coal



Matthew J. Hrebar

cutler, tracklayer, maintenance man, and engineering trainee. He holds Pennsylvania bituminous miner's and shotfirer's certificates. Since graduation in June, 1941, he has worked as a production and installation engineer and as a junior sales engineer for the Joy company.

R. E. KIRK, general superintendent of coal mines, Tennessee Coal, Iron & Railroad Co., Pratt City, Ala., has been promoted to assistant vice-president in charge of raw materials.

H. LIONEL KRINGEL, chairman of the board, has been elected president of the Pennsylvania Coal & Coke Corp., operating in central Pennsylvania. He succeeds the late Mark W. Potter.

KENNETH LEE, Wilkes-Barre, Pa., has been appointed an inspector and assigned to the 13th anthracite district.

JOHN LITER, of the Liter Coal Co., Knoxville, Iowa, is now a member of Bituminous Coal Producers' Board No. 12, succeeding H. W. WEBB, of the Twin Elm Coal Co.

LLOYD LIVINGSTON has been advanced to general manager of operations of the Feds Creek Coal Co., Feds Creek, Ky., in the Big Sandy district. He has been with the company for several years.

E. J. MANDT has been named assistant manager of the Jennie Rue Coal Co., Carbon Glow, Ky., on the Rockhouse Branch of the Louisville & Nashville Ry. He was formerly connected with the Rockhouse Coal Co.

W. FLOYD MERCER, former manager of the Elkhorn Junior Coal Co., Millstone, Ky., has been advanced to general superintendent of the Premium Coal Co., Premium, Ky. For ten or twelve years Mr. Mercer was connected with the company at Millstone, Ky.

HARRY QUENON has been named superintendent of Keystone mine, Koppers Coal Div., Eastern Gas & Fuel Associates, Vivian, W. Va.

E. H. QUICK has been appointed chief engineer for the Elk Horn Coal Corp., Wayland mines, Wayland, Ky. He had been with the Clear Creek mines of the Clear Branch Mining Co., Ligon, Ky., for several years as engineer, previous to which he was engineer for the Consolidation Coal Co. in the Elkhorn field.

THEODORE DAVIS REES, Clarks Summit, has been named by Governor James of Pennsylvania as an anthracite inspector to serve in Lackawanna County.

J. J. SELLERS, formerly general manager, eastern mines, Blue Diamond Coal Co., Knoxville, Tenn., has resigned to become affiliated with the firm of Peat, Marwick, Mitchell & Co., certified public accountants, New York City.

JOHN R. SHOFFNER, chief engineer for the Allegheny River Mining Co., Kittanning, Pa., has been elected State director on the executive board of the Pennsylvania Society of Professional Engineers, representing the Pittsburgh Chapter.

K. A. SPENCER, vice-president and general manager, Pittsburgh & Midway Coal



FOR A TOUGH JOB



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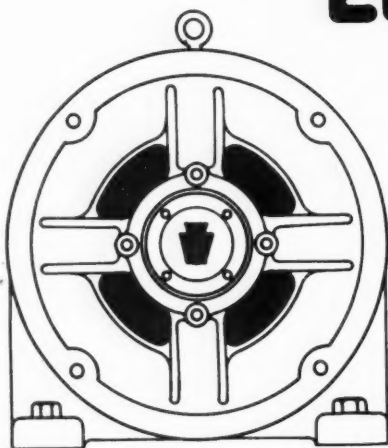
If it operates in the mines . . . it has to be tough. And there's no tougher job for apparatus cable than service in the collieries where they're producing tremendous quantities of coal for war industry's seemingly endless demand. Supplying continuous power to cutters, loaders and locomotives day in and day out, requires a superior cable. That's why mine operators insist on Deltabeston. They know from experience that Deltabeston "delivers the goods" . . . where others might fail.

Deltabeston Mine Locomotive Cable is specifically designed for general use in the mines. It is composed of a large number of soft, small copper strands to overcome vibration. Deltabeston is insulated with felted asbestos, varnished cambric insert and asbestos braid which resists the action of heat, oil, grease, moisture and corrosive vapors.

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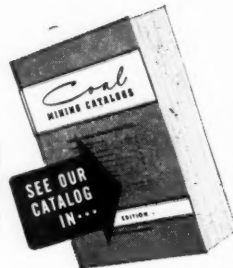
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Mining Co., Pittsburg, Kan., has been elected president. He succeeds his father, who died Dec. 1. The new president, who has been with the company 18 years, also is president of the Osage Coal Co., Ottawa, Ill. He was president of the Southwestern Interstate Coal Operators' Association in 1934. His brother, HAROLD H. SPENCER, has been named vice-president and treasurer of Pittsburg & Midway. He also is president of the Pioneer Coal Co., Pittsburg.

CAMPBELL WALL, formerly sales engineer, Enterprise Wheel & Car Corp., Huntington, W. Va., has accepted an appointment in the Redistribution Division of the War Production Board, Huntington (W. Va.) Division.

WALLACE WELLS, mine foreman for the Consolidation Coal Co., McRoberts, Ky., has resigned that position to join forces with the Cameo Coal Co., Cameo, W. Va. He had been with Consolidation for a number of years.

R. Y. WILLIAMS, Pottsville (Pa.) engineer, has been named operators' representative on the executive committee of Anthracite Industries, Inc., succeeding FRANK W. EARNEST JR., president.

E. P. WOLFE, for several years connected with the Consolidation Coal Co., Jenkins, Ky., has become general superintendent of the Cameo Coal Co., Cameo, W. Va. Before his connection with Consolidation Mr. Wolfe was with the Elk Horn Coal Corp.

Blue Diamond Developing Another Kentucky Seam

At Chevrolet, Harlan County, Kentucky, the Blue Diamond Coal Co. is developing an additional seam of coal which is high on the mountainside and will use the existing tippie by installing a rope-and-button conveyor and a belt conveyor. This additional seam, which is now about ready to produce, will gradually replace the seam now being worked, which is approaching depletion. No increase in production is contemplated.

C. B. JACKSON, Jr., formerly superintendent of the Blue Diamond (Ky.) mine, promoted to general manager of leased mines of the Blue Diamond Coal Co., also will be in charge of construction and preliminary operations of new mines.

Obituary

W. F. TAMS, 60, general manager, Gulf Smokeless Coal Co., Tams, W. Va., died Dec. 22 at a Beckley hospital of injuries received the day before when he was caught in a conveyor chain. He was recently elected treasurer of the Winding Gulf Operators' Association. Mr. Tams and his brother, Major W. P. Tams, owner of the Gulf Smokeless Coal Co., went to the Beckley field in the early 1900's and began work with the late Samuel Dixon, who organized the New River Co. When Major Tams started the Gulf Smokeless company, W. F. Tams entered

the employ of the Chesapeake & Ohio Ry. When W. P. Tams entered service in the first World War his brother became general superintendent at the company's operations.

TUDOR J. ASTON, 60, inside foreman at Dorrance colliery, Lehigh Valley Coal Co., Wilkes-Barre, Pa., died Dec. 15 while walking up a slope in the mine. He had been 20 years in the company's employ.

EMORY LEYDEN FORD, 67, president, Ford Collieries Co., Curtisville, Pa., died Dec. 20 in Jennings Hospital, Detroit, Mich., after a brief illness, following a heart attack. He also was president of the Michigan Alkali Co. and the J. B. Ford Co., and vice president of the Huron Portland Cement Co., Detroit.

Anthracite Cave-In Solutions Proposed by Commission

Six possible solutions of the anthracite cave-in problem—including a State Board of Control for the hard-coal industry—were suggested by a legislative commission in session Jan. 26 at Harrisburg, Pa. It also asked more time to study a form of subsidence insurance. The commission, created by the 1941 Assembly with instructions to report by Feb. 1, received immediate Senate approval to extend its work until March 15. The House delayed action on the matter.

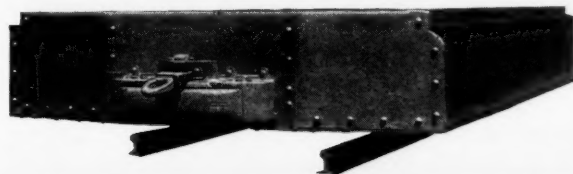
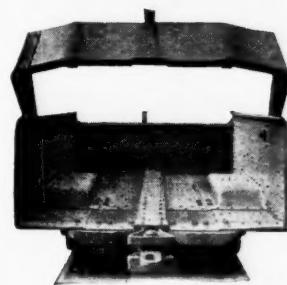
A preliminary report submitted to the Legislature said the 10-member group "is studying a plan of subsidence insurance under which the General Assembly would appropriate a sum of money sufficient to inaugurate a form of subsidence insurance."

The proposed solutions which the group, headed by Senator George B. Stevenson (R., Clinton), said occupied its time and attention were:

1. Enlarge the duties of mine inspectors to cover damage to the surface.
2. Revive the Kohler-Fowler bill, an act of the Pennsylvania Legislature regulating mine subsidence which the U. S. Supreme Court declared unconstitutional in 1922 as interfering with the coal owner's right to surface support either reserved by the coal owner when the surface was sold or acquired by the coal owner from the surface owner. (The Kohler-Fowler Act would have prevented coal companies from mining under any dwelling or other structure in such a way as to cause mine cave-ins. It called for a year in prison and a \$10,000 fine for violation.)
3. Creation of an anthracite control board with power similar to that of the Milk Control Commission, vested with powers of regulation to control what the report termed "scavenger" operations and also to provide for the safe removal of the greatest possible tonnage of coal.
4. Federal aid received under the conservation program of the Federal Government.
5. A tonnage payment of about 2c. a ton to be paid by the coal companies and matched by the State to be available in cases of damage due to subsidence.
6. Flushing, which was termed "the most widely recommended practice for the prevention of subsidence."

On "24 HOUR NIGHT" Duty...

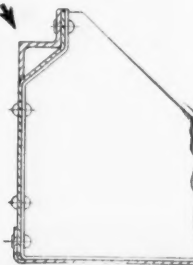
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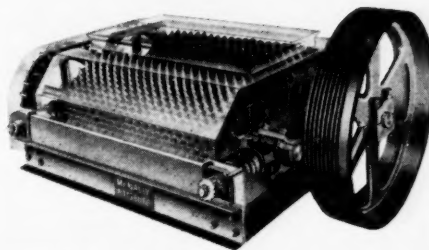
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Note the exclusive design feature of this Low Height Rotary Dump Car—Combination flanged side sheet and heavy "Z" bar, provide rugged top chord construction, with shelf for holding car in dump. Top leg of "Z" bar is riveted and bottom leg is welded to side plate.



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EXAMPLE: One operator's record showed the following: Three PLAT-O tables handled over 33 tons of sludge per hour . . . recovered an averaged 60% as saleable coal . . . 147 tons per 7 hour day . . . at an estimated cost of .06 per ton for handling. Value of recovered coal, \$1.65 per ton.

Today, when every extra ton of fuel is vital, thousands of tons of good, fine coal are being washed into the sludge pond.

The fuel value in these finer sizes (3/16" x 0") can be readily and efficiently recovered on PLAT-O Coal Washing Tables, with a minimum investment in equipment. The normal rated capacity is 15 or more tons per hour per table. No previous screen sizing is required. Separation is always in full view and one man can easily handle up to 20 tables. Deister engineers, all specialists in wet gravity separation, will be glad to study your material, at our factory or at your mine, without obligation.

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Award Anthracite 'A' Flags For Cut in Absenteeism

Nineteen collieries in the Pennsylvania anthracite field have been awarded "A" flags for outstanding performance in cutting down absenteeism. Since last summer the Anthracite War Production Committee has been setting up these incentives for labor-management victory production committees at the collieries to shoot at establishing better work records by employees.

"A" flags have been awarded Dial Rock colliery, Dial Rock Coal Co., Wyoming; Loree, Powderly, Pine Ridge, Miles Slope, Marvine and Olyphant collieries, Hudson Coal Co.; Jeddo machine shop and Highland No. 5 colliery, Jeddo-Highland Coal Co.; Lattimer colliery, Lattimer Coal Corp.; Spring Mountain colliery, Stevens Coal Co.; Coaldale colliery, Lehigh Navigation Coal Co.; St. Nicholas breaker, Little Mine Run and Maple Hill collieries, Philadelphia & Reading Coal & Iron Co.; Raven Run colliery, Hazle Brook Coal Co.; New Castle colliery, Repplier Coal Co.; and St. Clair Coal Co.

Industrial Notes

AMERICAN PULVERIZER CO., St. Louis, Mo., has appointed Howard L. Hill as eastern representative with office at 101 Park Ave., New York City.

R. G. LE TOURNEAU, INC., plants at Peoria, Ill., and Stockton, Calif., received the Army-Navy "E" award on Jan. 6.

COPPERWELD STEEL CO., Warren, Ohio, has appointed E. W. Husemann as metallurgist in its metallurgical department. He formerly was with Republic Steel Co. at Chicago.

MACWHYTE CO., Kenosha, Wis., was formally presented with the Army-Navy "E" award on Dec. 27.

JOSHUA HENDY IRON WORKS, Sunnyvale, Calif., has purchased the Pomona Pump Co., Pomona, Calif., and its recently acquired subsidiary, the Westco Pump Division, St. Louis, Mo. Hendy also has purchased the plant and equipment of the Hydril Co., Torrance, Calif., to supplement the facilities available at Pomona. With these purchases the Hendy interests now embrace four of the major engineering fields: mechanical, electrical, hydraulic and steam, with steam engines, turbines, electric motors and generators, flexible couplings and a wide range of pump types, as well as ship-propulsion equipment and large gear-reduction units.

DOW CHEMICAL CO., Midland, Mich., has been presented with two Army-Navy "E" flags for production excellence.

FAIRBANKS, MORSE & CO. plants at Beloit, Wis.; Freeport, Ill., and Three Rivers, Mich., have been awarded the Army-Navy "E."

JOHN A. ROEBLING'S SONS CO., Trenton, N. J., has promoted E. G. Hartmann

to assistant general manager of sales. In 1941 he was advanced from manager of round wire and flat wire specialties division to assist the general manager of sales. His entire experience of 20 years has been with the Roebling company, by whom he was employed in the Chicago branch after attending the University of Chicago.

CRANE Co., Chicago, and its nearly 15,000 employees have been cited for the Army-Navy "E" in meeting war-time demands for valves, fittings and piping accessories.

BABCOCK & WILCOX Co.'s works in Augusta, Ga., has been awarded the Army-Navy "E" for outstanding production of refractories, the award ceremonies taking place Jan. 22. Previously, the company's Barberton (Ohio) works received the Navy "E," the Maritime "M" and the Army-Navy "E."

UNION WIRE ROPE CORP., Kansas City, Mo., has been granted a renewal of the Navy "E" award for an additional period of six months. This grants the right to add a white star to the pennant.

BUCYRUS-ERIE Co.'s Erie (Pa.) works has been granted the Army-Navy "E" award for production achievement. This is in addition to a similar award to the company's South Milwaukee (Wis.) plant.

WEIR KILBY CORP., Cincinnati, Ohio, was formally presented with the Army-Navy "E" award on Jan. 13.

ALLIS-CHALMERS Co. tractor plant, Springfield, Ill., has been awarded the Army-Navy "E" for production achievement.

ROBERTS & SCHAEFER Co., Chicago, elected R. T. Middleton vice president and a director at its annual meeting. William C. McCulloch, preparation manager, also was elected a director.

AMERICAN BRAKE SHOE & FOUNDRY Co. has appointed James R. Hewitt as vice president of its American Manganese Steel Division.

TENNESSEE COAL, IRON & RAILROAD Co. plants at Ensley, Fairfield and Bessemer, Ala., received Army-Navy "E" production awards on Jan. 26.

Logan-Mingo Association Formed for Welfare Work

The Logan-Mingo Community Association has been incorporated in Holden, W. Va., to engage in general welfare work and will sponsor and provide housing and other facilities for social service, charitable and similar organizations such as the Y.M.C.A., Y.W.C.A., Boy Scouts and Girl Scouts. Incorporators, who also are members of the board of trustees, include: Dr. W. W. Curry, Island Creek Coal Co. medical department; R. E. Salvati, vice-president and general manager of Island Creek; C. McD. England, J. B. Babyak, J. J. Foster, E. F. Clevenger and R. S. Flint. Officers named are: president, Dr. Curry; vice-president, Mr. England; secretary-treasurer, Mr. Clevenger.

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KEEP AMERICA STRONG
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ger; assistant secretary-treasurer, Mr. Flint.

Facilities are to be made available, according to Dr. Curry, for mine classes, university extension work, scientific studies and health education. As soon as possible after the war, construction of a suitable recreation building in the vicinity of Holden is to be undertaken. Meantime, however, the association will endeavor to acquire the best housing facilities available and equip them as well as war-time conditions will permit.

Initial activities of the new organization are to be concentrated "on the waters of Island Creek," where, said Dr. Curry, there is a definite need for recreational agencies and facilities that will serve a character-building purpose. The need, he added, is especially acute under present war-time conditions. "Immediate activities of the association," Dr. Curry continued, "will not only be of great benefit to the coal-mining communities but also will further the war effort by improvement of workers' morale." Initial work at Island Creek will be used as a model for similar activities in other localities, which will be undertaken as soon as funds are available.

With a view to beginning work immediately, the association is earnestly soliciting funds, prospective donors being urged to communicate with Dr. W. W. Curry, Holden, W. Va.

Globe Acquires Alaska Mine In New River Field

The Alaska Coal Co.'s mine, at Beclick, in the New River field of West Virginia, has been acquired by the Globe Coal Co., of Chicago. Walter J. Tuohy, of the Globe company, is to be president of the producing company, and Owen W. Cox, former president of the Alaska organization, has been retained as general manager. Development work on the new mine had so far progressed that production was scheduled to start early in January. The mine, a drift operation in the Fire Creek seam, is to have a capacity of 700 to 800 tons per day and ultimately will employ about 150 miners.

Pursglove Mine Fire Kills 13

A fire which broke out in the early morning of Jan. 8 in Mine No. 15 of the Pursglove Coal Mining Co., Pursglove, W. Va., took a toll of 13 lives, 65 others escaping. The 13 men who lost their lives were isolated in a small section when a mine motor caught fire more than two miles from the mine entrance. One body was recovered a few hours after the fire started and eleven more were found the following day. Guy Quinn, night foreman, who had escaped, perished when he returned and made a vain attempt to rescue the men he knew were caught behind the wall of fire.

Crews working under supervision of federal and State mine inspectors on Jan. 12 began sealing operations in an effort to extinguish the fire, direct methods having failed.

Higher Mining Machinery Output Studied: Coal-Mine Priority Ratings Raised

WAYS AND MEANS of increasing the output of mining machinery to enable the coal industry to meet the 1943 production goals was the subject of conferences between the Mining Equipment Division of the War Production Board, the Office of Solid Fuels Coordination for War and committees of operators and manufacturers in January. The demand for 1943, according to surveys by the Solids Fuels office, is expected to be 600,000,000 tons of bituminous coal and 65,000,000 tons of anthracite. Bituminous capacity, on the other hand, was but 570,000,000 tons at the time of a companion survey made toward the end of 1942.

The questions of the industry's needs and what might be done about them were canvassed at conferences with operator and equipment advisory committees. The latter was formally organized as a WPB Industry Advisory Committee by A. S. Knoizen, director, Mining Equipment Division, under procedure set up by the WPB Director General for Operations.

Confer on Requirements

Invitations for an informal operator conference Jan. 5 were issued by Director Knoizen Dec. 23, this conference to discuss problems in the receipt of maintenance and repair items, expansion programs in 1943 and the requirements for new equipment, how to curtail the use of critical materials as far as practicable, the Controlled Materials Plan in relation to mine operation, methods for closer cooperation between operators and the Equipment Division on problems and requirements, experience with priority ratings as a means of supplying the industry's needs, effects of manpower losses and whether these can be offset by more machinery, and the need for employing all used equipment possible.

The agenda for the manufacturers' meetings included, it is reported, their needs for materials, manpower and operating supplies, as well as repair and maintenance items, preference ratings needed, the problems of equipping the mines for further increased production and conflicts in manufacturers' plants between production of ordnance and production of essential mining equipment and repair parts.

Following the Jan. 5 meeting with the operators, a WPB release stated that only the high priority ratings recently granted the mining industry make it possible to avoid a serious curtailment of production. Electric motors and controls, copper cable and alloy-steel parts were among the most needed and most difficult to get items, in the opinion of the operators. Trucks, certain types of timber and other items in short supply take months to acquire. The repair work done in mine shops is growing materially, increasing the need of the industry for shop supplies, welding rod and similar items. Some operators reported the use

of second-hand parts and machinery up to 25 percent of the cost of an equipment job, although available supplies of used equipment now seem about exhausted. Important increases in equipment are needed to materially increase production, the operators reported, especially since the greatest increase could be obtained by mechanizing mines not now so equipped. Use of critical materials has been cut to the bone. A further meeting was scheduled for Jan. 25 and others will be held from time to time in the future.

Operators were urged by WPB to strengthen their work in conserving equipment and materials and in getting the most out of what they have. Used equipment must be employed whenever possible. Care in asking for additional quantities of such especially critical items as copper and alloy steel was stressed by WPB, which at the same time asked that essential requirements be anticipated at least 60 to 90 days ahead.

Following the Jan. 11 meeting with the manufacturers, a WPB release stated that "production of mining machinery could increase at once some 20 percent with present plant facilities if manpower and materials were available, and within six months many plants could increase more than 40 percent, it was estimated by the Mining Machinery Manufacturers' Advisory Committee at its first meeting in Washington. Some further expansion of production could be accomplished by re-conversion of plants from ordnance to machinery."

More Equipment Needed

"We must find ways to make available more equipment to the highly essential coal, metal and non-metallic mining industry," declared Mr. Knoizen. "In order that the output of essential minerals may not be slowed down by equipment breakdowns it may be necessary to set up WPB control through mandatory scheduling of mine-machinery production and delivery both for domestic use and lend-lease. Through such scheduling we hope to achieve maximum utilization of materials, facilities and manpower." Some manufacturers, it was reported, felt that such scheduling should start at once, while others were of the opinion that April 1 would be the more desirable. Another meeting of the committee was set for Jan. 22.

Higher priority ratings were granted both manufacturers of mining machinery and coal mines for the first quarter of 1943. These higher ratings were first announced in December and in January this year some of them were revised upward and the process of applying them was speeded up. The December announcement covering quotas for the first quarter stated that they would carry the following ratings: manufacture of new mining equipment, production material and operating supplies—AA-2X, 90 percent; AA-4, 10; material for the maintenance and repair of the manufacturer's

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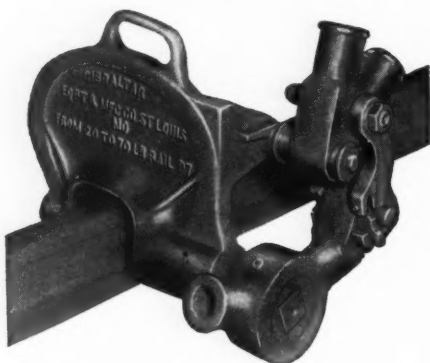
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"You can win the all-out fight for bigger tonnage by using the most efficient mining tools you can get!"

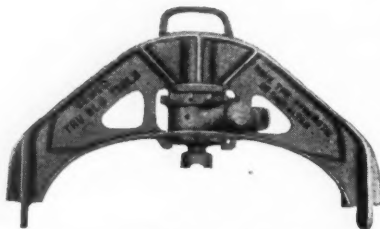
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plant—AA-1, 100 percent; manufacture of repair and replacement parts when clearly identified and separated in specific columns of Form PD-25A—AA-1, 90 percent; AA-4, 10 (to be used only for such weights of carbon or alloy steel, copper or other materials as the mills can furnish under their production programs; otherwise, for small quantities of these materials, the manufacturer must use the higher rating and charge such quantities against his AA-1 quota); coal mines—maintenance and repair, AA-1; operating supplies, AA-2X.

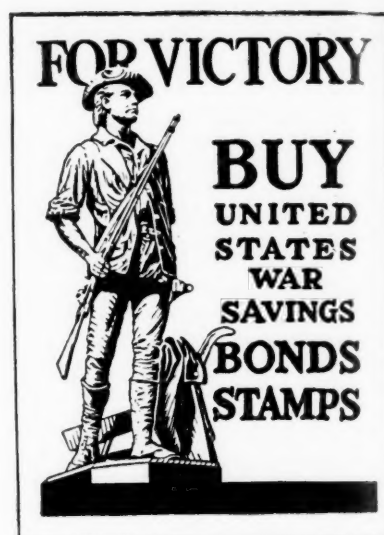
Former ratings were: AA-3 and AA-4 for materials required by manufacturers, AA-2X for mine maintenance and repair, and A-1-a for operating supplies.

Mines having orders for repair parts pending with manufacturers were urged by the Mining Equipment Division to re-rate them at once. At the same time, manufacturers whose requirements are handled by the Mining Equipment Division were authorized to revise their PD-25-A preference ratings for the production of new equipment to the following: AA-1, 50 percent; AA-2X, 40; and AA-4X, 10, compared with the previous 90 AA-2X and 10 AA-4. Ratings for the manufacture of repair parts for equipment were left unchanged at 90 AA-1 and 10 AA-4. Later in the month it was announced that outstanding orders for new equipment with ratings lower than AA-2X would be re-rated automatically by manufacturers in the Mining Division. In the case of manufacturers not in the division, re-rating can be done only by application to and approval of the division.

CMP Outlined

As a further step toward instituting the Controlled Materials Plan, Regulation No. 1 was issued Jan. 12 giving the general details and methods of applying for allotments of steel, copper and aluminum, and defining the rights and obligations of industry under the plan. Regulation No. 2, issued shortly thereafter, prohibits the acceptance of any controlled materials from suppliers after April 1 which would result in inventories in excess of 60 days' forward requirements. Six new agencies to present claims for critical materials were set up, including the National Housing Agency, Office of the Rubber Director, Office of Defense Transportation, Petroleum Administrator for War, Food Administrator and the WPB Facilities Bureau. Authority to allot rubber among all claimant agencies, military and civilian, was conferred on Rubber Director William Jeffers in an amendment to WPB Regulation No. 1.

January brought an announcement that practically all PD-25-A and PD-400 forms had been processed and quotas for the first quarter issued. It also was announced that manufacturers and mining companies would use a new form of PD-25-F in applying for supplementary authorizations under PRP, and that PD-400 forms would be continued for second-quarter maintenance quotas for all mines holding serial numbers under Order P-56. PRP, with its complicated PD-25-A form, it was indicated, probably would be dis-



continued, as Ernest Kanzler, WPB Director General for Operations, stated that it was not contemplated that any maintenance, repair and operating items would be applied for on this form.

CMP forms, requesting "Bills of Materials," were mailed to all concerns, including mining companies, who filed PD-25-A's for the first quarter, but mining company serial number holders were advised that they were exempted from completing or returning the forms.

Priorities Regulation No. 3 was revised to simplify the application of preference ratings in telegraphic and telephonic orders. Other materials and price actions in January included a ruling on Limitation Order L-221 that the Mining Equipment Division could approve the sale of motors to mines where they would not operate at full capacity in cases where they are designed to fill a specific requirement. Manufacturers producing special-type motors or generators for use only on machines they build are not now required to file production schedules with the WPB Administrator of L-221. The order also was amended to provide that motors and generators must bear ratings of AA-5 or higher before being accepted by manufacturers or dealers.

Sales and delivery of electric fuses and parts were limited after Jan. 21 to orders rated A-1-J or higher. This followed a December order limiting sales of metal tubes, conduits or raceways for electric wiring unless they also carry a rating of A-1-J or higher. Used material was exempted. It also was announced that priorities assistance in the purchase of boilers would be withheld until every effort had been made to purchase used units.

Regional WPB offices were authorized, upon recommendation of district offices, to issue AA-1 ratings, and the district offices up to AA-2X, for emergency repairs providing the priority assistance does not exceed \$500.

OPA placed all wooden mine materials and industrial blocking produced in Illinois, Indiana, Missouri and northern Arkansas under the regulation controlling prices on these materials produced in the Appalachian region. The amendment became effective Jan. 11.

Coal, Though Tighter, Still Meets Demands; Use of Fuel Oil Cut Still Further

Both Commercial and Non-Essential Industrial Oil Reduced Again in the East—Oil Flow Starts Through New Pipeline—Tight Coal Supply in Some Sizes and Regions Results in Impromptu Control Steps

WITH the fuel-oil crisis in the East still further complicated by the anthracite dues strike, a measure of impromptu and unofficial rationing and control of distribution of coal made its appearance in January. At the same time, sharp cuts were made in the consumption of gasoline and in certain fuel-oil uses, while further measures were taken to build up the movement of oil into the area and speed conversion. Some 2,924 commercial users of heavy fuel oil in the East, it was announced early in January, had converted to coal, effecting a saving of 30,670,493 bbl. annually. Another 4,182, in the process of converting, will save 38,088,591 bbl. a year. In the domestic field, however, only 104,000 burners had been converted with an annual saving of 5,200,000 bbl. Total domestic burners in the eastern area have been placed at 1,440,000. Approximately half cannot be converted.

Oil Hits Tough Going

Oil began to strike harder going early in the year in the East, as the shortage of transportation facilities plus heavy demands ran stocks down toward the danger mark. The value of coupons for Period 3 in 17 eastern states and the District of Columbia was cut 10 percent beginning Jan. 4. At the same time, Leon Henderson, OPA Price Administrator, gave all owners of commercial buildings in the 30 rationed states capable of conversion to coal the choice of so converting or losing their fuel-oil rations by the end of the month. Local rationing boards were directed to terminate all rations for apartment buildings, hotels, theaters, office buildings and all other structures except private dwellings unless written proof was presented that conversion would be completed by a definite date in the current heating season, or that conversion was impossible.

Further drains on stocks resulted in a ban on all pleasure driving in 17 eastern states and the District of Columbia on Jan. 7 and a further 25 percent cut in the already reduced rations for all non-residential buildings, allowing these structures about 45 percent of their normal quota of oil to make 1,500,000 gal. available for dwellings. The elimination of pleasure driving, it was stated, probably would continue until the end of the present heating season. On Jan. 13 it was announced that fuel-oil and gasoline resellers and industrial and commercial consumers would be restricted to a 10-day inventory. Non-essential users of oil for other than heating purposes were cracked down Jan. 15 with an order requiring a 40-percent cut in their consumption. Included in those exempt from this order were public communication services, hospitals, transportation services, water-supply and sani-

tation systems, food-preservation and packing plants, and industrial plants making various materials essential in the war effort. The new order, applying in 17 eastern states and the District of Columbia, is to remain in effect until April 1. It does not affect consumers using oil for heating purposes.

With the growth in the oil shortage came talk of a priorities list to regulate deliveries in accordance with preference ratings. Unofficial opinion at the end of the month, however, was to the effect that the plan had been shelved because it was felt that anti-discrimination orders and the cuts in non-residential and non-essential-manufacturing oil had made such a step unnecessary.

Evidence that government officials were determined to put teeth in conversion orders was afforded by an announcement Feb. 22 that 3,000 commercial users of oil in Philadelphia would be without heat after Feb. 8 because they had failed to offer any excuse for not converting for coal. OPA spokesmen said that oil companies would be instructed not to honor their coupons. The group represents about one-third of all Philadelphia consumers using 2,000 to 10,000 gal. of oil per season.

Increased movement of oil to the East was one January development, largely as a result of more equipment and better tank-car schedules, plus the effects of pipeline construction, relocation and reversal, and other measures. In the week ended Jan. 2, daily tank-car movement of petroleum and petroleum products to the East averaged 775,409 bbl. daily. In the following week it rose to 822,000 bbl. and reports were that the goal of 900,000 bbl. daily was in sight, although this still left the East short of requirements.

Oil started moving through the Texas-Norris City, Ill., pipeline Dec. 31, 1942, although it was not connected up until Jan. 21, when replacement of a section

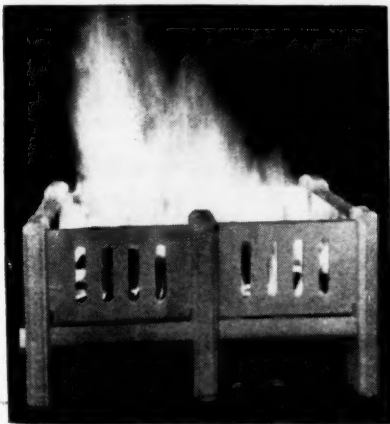


Photo by Office of War Information
Ceramic grates, one of the new measures adopted to meet the eastern oil shortage.

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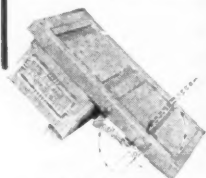
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Magnetic Pulleys



Suspended Magnets

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**STEARNS MAGNETIC
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washed out by a flood in the Mississippi was completed. Meanwhile, construction of the leg from Norris City to the East was pushed. The original line is not expected to be operating at capacity for some weeks, however, as all the pumping stations have not been completed. When completed, it is expected to increase the movement to the East Coast some 120,000 bbl. daily by shortening present tank-car hauls.

Construction of a 20-in. "products" line from Beaumont, Texas, to Seymour, Ind., was authorized by the War Production Board Jan. 26. It is expected to add 110,000 bbl. a day to the fuel-oil and gasoline supplies in the East.

While there were no real shortages, a growing tightness in coal supply in certain regions of the country resulted in some impromptu and unofficial rationing and distribution control in January. Most of the attention centered in the East, where increased conversion, greater demand for coal as a result of lower temperatures and the dues strike reduced anthracite supplies, especially certain sizes.

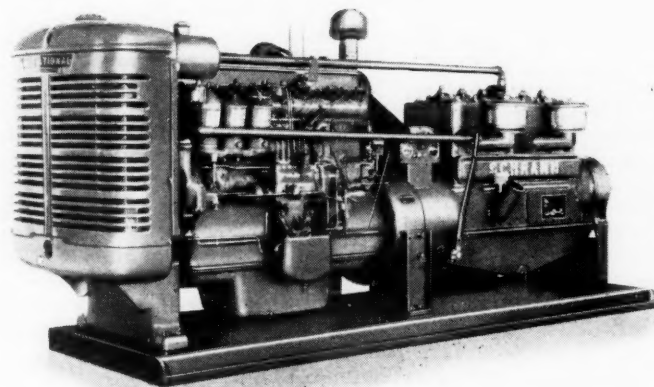
A tight anthracite situation, especially in the domestic sizes, was reported as early as Jan. 5 by Solid Fuels Coordinator for War Ickes, who stated that dealers were spreading deliveries in many communities to provide adequate fuel for immediate requirements. As the dues strike wore on and cost the industry an increasing tonnage, the situation got tighter. On Jan. 14, therefore, Coordinator Ickes announced that anthracite shippers had been requested to concentrate shipments primar-

ily into the eastern states and suspend movement to points west of Erie, Pa., and to Canada. At that time, he reported, the dues strike had cut anthracite output 40,000 tons per day.

To further relieve the situation, the Coordinator announced that arrangements had been made to increase shipments of bituminous coal into the area for domestic use, at least temporarily. Gen. Brice P. Disque, assistant coordinator, stated that the bituminous industry could supply about 200,000 tons per week if necessary, and urged: (1) that anthracite dealers lay in soft-coal supplies and (2) that consumers operate on minimum supplies in their bins for the present. Dealers, General Disque revealed, had agreed to a suggestion that deliveries be withheld where the customer had sufficient coal for minimum immediate requirements, meaning a seven to ten days' supply.

Ending of the anthracite dues strike Jan. 22, however, was expected to ease the situation materially in the East, where anthracite supplies were held to be adequate in general, although tightness in certain sizes and perhaps temporarily in certain areas, it was conceded, might be expected from time to time.

Supplies of bituminous coal likewise were held ample to take care of all demands in the East, including new ones growing out of conversion work in such regions as New England. No lack of transportation was envisaged, either. The month, however, brought out a growing volume of suggestions for the economical use of coal, including government pamph-



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lets and leaflets on firing in the home and advertisements in New York City newspapers by the New York Steam Corp., beginning Jan. 20. These advertisements asked that consumers keep room temperatures at 65 deg. or less and otherwise take steps to reduce heat use to release transportation facilities and promote the conversion of additional structures by making it possible to extend service.

Conservation of all fuels, including coal, was the objective of reported plans for extending the "dim-out" to the entire country. The coal supply, a WPB official stated, still is in good shape, "but the growing shortage in some areas brought on by transportation difficulties may necessitate a cut in the consumption of power generated from coal."

A tight bituminous situation west of the Mississippi River was reported by Howard A. Gray, Deputy Solid Fuels Coordinator for War, in testifying Jan. 8 before a special Senate Committee on the Midwestern and Western Fuel Situation. This situation, Mr. Gray stated, arises primarily out of a lack of mining manpower, difficulty in getting materials and supplies and heavy war-industry demands for natural gas, forcing normal users to turn to other fuels. It is especially noticeable along the Missouri River and in Washington and Oregon. Heavy increases in shipments from other states, especially into Kansas and Missouri, have been necessary to meet demands, as well as from Utah, Wyoming, Montana and Canada, and even from the Head of the Lakes, to Washington and Oregon. More men, said Mr. Gray, would go far toward a solution, and 1,500 would take care of most of the shortage. Consumer storage in the coming year to the limit of capacity also is imperative.

Rationing Talk Slackens

Rationing discussion in Washington and elsewhere flowed and ebbed again in January. Talk about the prospects increased early in the month, presumably as a result of the oil situation and the dues strike in anthracite, but when fears that a coal shortage was imminent died out, the discussion more or less died out with it. A radio talk by Coordinator Ickes may have had something to do with the course of events. Stating that, if necessary, there were ample supplies of bituminous coal to take care of any hard-coal deficit and its share of any conversions, Mr. Ickes also declared that "with respect to this coal problem and conversion I want to make three facts plain. First, the processes of production, of the transportation and local distribution of coal have not been disrupted as they have been for oil. Second, in many instances the claims of an actual or impending coal shortage have been either groundless rumor or mere smoke screen for those oil consumers who cannot or will not see the logic of conversion. And finally, we in the Petroleum Administration for War have repeatedly stressed the fact that conversions of oil-fired equipment should only be undertaken when an adequate supply of a suitable substitute fuel is assured."

Rationing of bituminous coal, the

National Coal Association declared in a statement Jan. 9, is unnecessary because of ample supply to meet every present need. Consumers with large stockpiles, however, were urged to relinquish a portion of their deliveries, if necessary, to relieve any shortages that might develop.

"The producers of bituminous coal," said the N. C. A. statement, "now appeal to their large customers to cooperate with them in an effort to meet all real needs for coal during the next several weeks, when transportation facilities will be heavily taxed and the demand will be very heavy. The industry and the railroads are now confronted with the gigantic task of fueling the nation and protecting oil conversions as well as supplying those plants, industries and railroads that did not or could not adequately protect themselves because of some physical or other limitations on stocking."

"In order to avoid a dislocation and disruption of orderly business during the next eight or ten weeks, industrial users of coal who have ample stockpiles to protect themselves over that period of time are being asked to further cooperate by voluntarily permitting those who customarily supply them with coal to switch at least some shipments to some other plants or railroads that are in desperate need of coal."

"A large portion of bituminous coal is sold under yearly contracts. The producers wish to observe their contracts. At the same time they know that the same patriotic spirit of cooperation will be manifested by their good customers who have ample stocks that was shown when the stocks were put in, in order that those less fortunate plants and industries, many of which are vital to the war effort, can be kept going."

"We must avoid a rationing program with all its red tape and disastrous effects no matter how well intentioned. As a matter of fact, no real system of rationing could be made effective before winter is over. Transportation would be wasted, new business relations would have to be established. It is urgently requested that in order that the entire country may be saved further inconvenience, producers and consumers of coal cooperate fully to the end that all essential industries may be kept in operation."

Canadian development in January had a striking similarity to many of those in the United States. On Jan. 6, for example, the Department of Munitions and Supply stated that no permits for further purchases of fuel oil would be issued after Jan. 15 unless the applicant could prove he was not responsible for failure to convert. With the unofficial embargo on anthracite shipments from the United States, dealers in eastern Canada were urged to supplement their supplies with bituminous coal and limit deliveries only to those domestic consumers with low supplies on hand.

Binkley Gets Gundlach Mine

The Binkley Coal Co. has acquired control of the mining property formerly owned by the Gundlach Coal Co. at Belleville, Ill., and will put it into operation.

ICC Reopens Ex Parte 148; Trust Action Suspended

The Interstate Commerce Commission Jan. 6 reopened for further hearing Ex Parte 148, Increased Rates, Fares and Charges, 1942, and scheduled oral arguments for Feb. 2. The proceedings in question authorized, among other things, freight-rate increases of 3 to 6 percent for the duration of the war and six months afterward, with specific increases of 3c. per ton for coal rates under \$1 and 5c. per ton for those over \$1. The increases were granted on the representation that they were necessary to offset the cost of pay rises awarded railroad workers Dec. 1, 1941, and at the time were opposed by OPA.

The present action is an outgrowth of further OPA action in requesting that the increases be cancelled on the ground that they are not now necessary to provide the extra revenue. OPA was joined in petitioning the ICC by James F. Byrne, Director of Economic Stabilization; Secretary of Agriculture Wickard; Luther Harr, Bituminous Coal Consumers' Counsel; and others.

Anti-trust indictments which were to be handed down charging rate-fixing by motor and rail carriers were postponed until the end of the war at the request of the Secretaries of War and Navy and director of the Office of Defense Transportation, according to an announcement Jan. 4 by Attorney General Biddle. The postponement was agreed upon Dec. 30, it was stated, on the ground that trial of the cases now would hamper transportation systems serving the war effort.

OPA Hikes Anthracite Prices

An increase in maximum prices for anthracite averaging 48.7c. per ton was announced Jan. 6 by Leon Henderson, OPA Price Administrator. The new prices went into effect Jan. 9. They were granted to offset higher production costs growing out of extending the work week to six days and increased costs in other directions since October, 1941, the period on which previous maximums were based. Overtime payments for work on the sixth day account for 27c. of the price increase, while 21.7c. covers other increases in costs. The new and old schedules of maximum mine prices are:

	F. O. B. Mine	
	New	Old
Domestic (broken, egg, stove, nut)	\$7.30	\$6.75
Pea	5.75	5.25
Buckwheat No. 1.....	4.20	3.75
Rice (Buckwheat No. 2)....	3.35	2.90
Barley (Buckwheat No. 3)..	2.50	2.15
All sizes smaller than barley for fuel or sintering uses*	1.80	....

* These sizes removed from general maximum price regulation and included under MPR No. 112.

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"Save Fuel for Victory," a booklet published as Circular Series No. 47, by the University of Illinois Engineering Experiment Station, Urbana, is a group



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of non-technical articles about insulation, heating-plant efficiency and related subjects, originally presented as talks over the University of Illinois Radio Station WILL. All the speakers are members of the staff of the Department of Mechanical Engineering and the Experiment Station of the University of Illinois. The booklet is priced at 25c.

Coal-Mine Accident Fatality Rate Registers Slight Upturn

Accidents at coal mines of the United States caused the deaths of 104 bituminous and 16 anthracite miners in November last, according to reports furnished the U. S. Bureau of Mines by State inspectors.

With a production of 46,800,000 net tons, the accident death rate among bituminous miners was 2.22 per million tons mined, compared with 1.96 in November, 1941.

The anthracite fatality rate from accidents in November last was 3.34, based on an output of 4,791,000 net tons, against 3.39 in the eleventh month of the preceding year.

For the two industries combined, the accident fatality rate in November last was 2.33, compared with 2.25 in the corresponding month of the preceding year.

Fatalities during November last, by causes and states, as well as comparable rates for the first eleven months of 1941 and 1942, were as follows:

DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS*
January-November, 1941 and 1942

Cause	Bituminous				Anthracite				Total			
	Number Killed	1941	1942	Killed per Million Tons	Number Killed	1941	1942	Killed per Million Tons	Number Killed	1941	1942	Killed per Million Tons
Underground:												
Falls of roof and coal..	529	531	1,158	1.008	96	121	1,911	2.186	625	652	1,232	1.120
Haulage.....	178	217	.389	.412	25	33	.498	.596	203	250	.400	.429
Gas and dust explosions:												
Local.....	21	15	.046	.028	9	7	.179	.127	30	22	.059	.038
Major.....	58	127	.127	.241	...	...	...	...	58	127	.114	.218
Explosives.....	20	17	.044	.032	15	12	.299	.217	35	29	.069	.050
Electricity.....	37	44	.081	.084	5	4	.099	.072	42	48	.083	.082
Machinery.....	28	39	.061	.074	...	1	...	.018	28	40	.055	.069
Shaft.....	7	4	.015	.007	2	2	.040	.036	9	6	.018	.010
Miscellaneous.....	15	29	.033	.055	12	10	.239	.180	27	39	.053	.067
Stripping or open-cut...	18	18	.039	.034	5	4	.099	.072	23	22	.045	.038
Surface.....	45	42	.099	.080	16	9	.319	.163	61	51	.120	.088
Grand total.....	956	1,083	2.092	2.055	185	203	3.683	3.668	1,141	1,286	2.249	2.209

* All figures subject to revision.

UNITED STATES COAL-MINE FATALITIES IN NOVEMBER, 1942, BY CAUSES AND STATES

State	Underground										Open-Cut	Surface	Grand Total
	Falls of Roof	Falls of Face	Haulage	Gas or Dust Explosions	Explosives	Electricity	Machinery	Other Causes	Total Under-ground				
Alabama.....	5	..	2	..	..	2	1	..	10	..	..	..	10
Arkansas.....	..	1	1	..	..	..	..	..	2	..	..	..	2
Colorado.....	..	..	1	3	..	..	..	..	4	..	..	..	4
Illinois.....	3	..	1	..	..	..	..	..	4	..	..	..	4
Kentucky.....	8	..	5	6	1	..	..	1	21	..	..	..	21
Montana.....	..	1	1	..	..	..	..	..	2	..	..	..	2
New Mexico.....	..	1	..	..	..	..	..	..	1	..	..	..	1
Ohio.....	12	..	1	..	..	..	..	..	3	..	..	..	3
Oklahoma.....	..	..	1	..	..	..	..	..	1	..	..	..	1
Penna. (bit.).....	8	..	5	..	..	..	3	..	16	..	..	..	16
Virginia.....	4	..	1	..	..	..	..	..	5	..	..	..	5
Washington.....	1	..	..	..	..	..	..	..	1	..	..	..	1
West Virginia.....	14	..	11	..	1	1	1	1	29	..	..	..	29
Wyoming.....	1	..	..	..	..	..	..	..	1	..	..	..	1
Total bituminous.....	46	3	30	9	2	3	5	2	100	..	..	..	104
Pennsylvania (anthracite).....	10	..	1	2	1	1	15	1	16
Grand Total.....	56	3	31	11	3	3	5	3	115	1	120

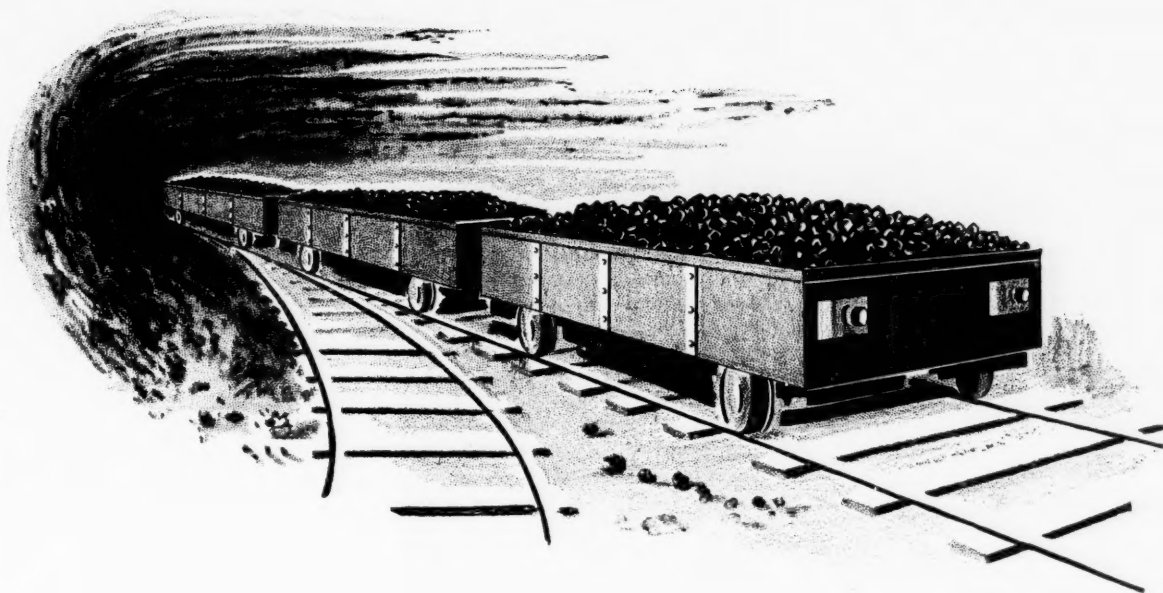
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Ball & Roller Bearing Greases	Hydraulic Oils, etc.



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H. A. Groseclose (left), chief electrician outside, and C. Whitehead, chief electrician underground, Boissevain colliery, Pocahontas Fuel Co., Pocahontas, Va.



Eddie Meyers, assistant chief electrician (seated); W. E. Hutchins and Milo Hovey, Superior Coal Co., Gillespie, Ill.



Herman L. Seekamp, chief electrician, Superior Coal Co., Gillespie, Ill.



Kelly Sult (left), chief electrician, and J. A. Macom, master mechanic, Pocahontas shop, Pocahontas Fuel Co., Pocahontas, Va.



S. P. Tabor, tippie foreman, Boissevain colliery, Pocahontas Fuel.

Coal Men on the Job

W. B. Coburn (left), assistant superintendent, and N. B. Mangus, superintendent, Boissevain colliery, Pocahontas Fuel Co., Pocahontas, Va.

D. P. Belcher (left), general mine foreman, and W. F. Wyrick, superintendent, East and West mines, Pocahontas colliery, Pocahontas Fuel Co., Pocahontas, Va.



H. B. Turner (left), assistant chief engineer, and L. E. Kelley, chief engineer, Red Jacket Coal Corp., Red Jacket, W. Va.



J. H. Edwards (left), associate editor, Coal Age, and J. F. Maurice, preparation engineer, Red Jacket Coal Corp.



W. R. Ward (left), chief electrician, Coal Mountain Operation, and C. H. Price, chief electrical engineer, Red Jacket Coal Corp., Red Jacket, W. Va.



O. L. Craven, mine foreman, and J. E. Jones, superintendent, Coal Mountain Operation, Red Jacket Coal Corp., Wyoming County, West Virginia





Charles Burnett (left), armature winder, Wayland, and S. H. Tucker, Fleming, superintendent of maintenance, Elk Horn Coal Corp.



Buck Layne (left), tippie foreman, Elk Horn Coal Corp., Wayland, Ky., and A. B. Brooke, coal inspector for Elk Horn Coal Sales Co.



J. A. C. Haymond (left), division engineer, Floyd County Mines, and Ervin Mullins, draftsman, Elk Horn Coal Corp.

by Editors on the Job



R. A. Suppes, superintendent, Floyd County Mines (left); Thomas C. Wallace, preparation engineer, and Harry B. Crane, of Fleming, general superintendent, Elk Horn Coal Corp.



W. W. Goldsmith (left), Charleston, W. Va., receiver; George Pow, land agent, and Howard N. Eavenson, receiver, Elk Horn Coal Corp.

G. S. Fuller, supply manager, Elk Horn Coal Corp., Wayland, Ky.



Morgan Hall, chief electrician, Floyd County Mines, Elk Horn Coal Corp.



F. H. Colley, general mine foreman, Floyd County Mines, Elk Horn Coal Corp.



No. 1 or day shift foremen, Wayland County Mines, Elk Horn Coal Corp., Wayland, Ky. (section foremen except as noted): Left to right, standing—Silbert Webb, C. C. Bowling, Ben Layne, James Castle, Joe Hicks, E. J. Durand, Virgil Combs, Clyde Wallins, John W. Wallace, Walter Lewis and Arthur Haywood. Kneeling—John Bently (assistant foreman), Sam Rector, Sam Noe, Dewey Sargent, I. M. Rector, Willard Castle (foreman, No. 1 shift), and T. H. Whitaker (dispatcher).



No. 2 or 4 p.m. to midnight shift foremen, Wayland County Mines, Elk Horn Coal Corp., Wayland, Ky. (all section foremen except as noted): Left to right, standing—Arthur Kilburn, Bill Brown, Frank Grimes (assistant foreman), George Lyons, Luther Allen, Russell Ramey, Delbert Davis, George Castle and George Banks. Kneeling—W. D. Conry, "A.B." (foreman), Fred Sayers, Everette Williams (dispatcher), Jack Allen, Hatler Kinney, Dan B. Hicks, Estil Cox (foreman, No. 2 shift), Delbert Webb and Frank Pittman.



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Carefully made from high-carbon crucible grade steel—heat-treated to obtain as much hardness and toughness as possible, to prevent broken tangs and points. Furnished up to 2" diameters—over all lengths, 16 ft. maximum.

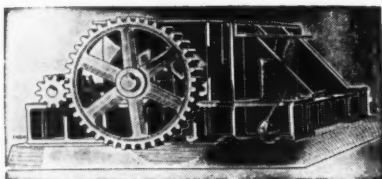
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A NEW VERSION OF AN OLD TYPE



"PENNSYLVANIA" TYPE "K" SINGLE ROLL COAL CRUSHER

With this advanced design, in rugged STEELBUILT construction, far more accurate sizing is possible to meet Code requirements through quick adjustability, in a range from 3/4" to 8".

Further—real protection is provided by improved Safety Toggle Equipment, which quickly passes Tramp Iron, and instantly returns Breakerplate to crushing position.

Seven (7) sizes afford a capacity range from 50 to 1000 tons per hour.

Send for Bulletin No. 2006.

Also,—"PENNSYLVANIA"
BRADFORD BREAKERS, BRADMILLS,
GRANULATORS, HAMMERMILLS
PUT YOUR COAL PREPARATION PROBLEMS
UP TO US.

PENNSYLVANIA
CRUSHER COMPANY

Liberty Trust Bldg. Philadelphia
Representatives in Principal Centers.

Rochester & Pittsburgh Coal Co. Leases Sagamore Mine

Sagamore mine of the Buffalo & Susquehanna Coal & Coke Co., in Armstrong County, Pennsylvania, has been leased to the Rochester & Pittsburgh Coal Co. The mine, which has been in operation since 1903, had an output of 433,125 tons in 1941. Frank M. Davis, vice-president in charge of sales and acting president of Buffalo & Susquehanna, had been in the company's employ more than 40 years.

Southern Colorado Starts Classes in Coal Mining

Vocational classes in mining were started in Trinidad, Valdez and Starkville, in the southern Colorado field, on Jan. 4. Subjects being covered are mine timbering, drainage, haulage, trackwork, explosives and blasting, geology of coal, mine ventilation, mine gases, use of the safety lamp, and Colorado mining laws. Special emphasis is to be placed on accident prevention and safety.

Instructors for the classes, who have been specially trained by Thomas Allen, State mine inspector, are: Joe Peduzzi, Trinidad; Frank Jerant, Valdez, and Bernard O'Donnell, Starkville. The Trinidad and Starkville classes are being sponsored by Trinidad Junior College, which will award certificates to all who complete courses under its supervision.

New Preparation Facilities

IMPERIAL SMOKELESS COAL CO., Quinwood, W. Va.—Contract closed with Kanawha Mfg. Co. for headhouse equipment consisting of Kanawha heavy-duty trip feeder and power rotary dump.

Hillman Buys Alicia Holdings

Hillman Coal & Coke Co., Pittsburgh, Pa., has purchased the Alicia No. 1 coke plant, formerly operated by the Monessen Coal & Coke Co., in Fayette County, having 400 rectangular-type coke ovens operating with shipped-in coal, and Alicia No. 2 mine, in Greene County, Pennsylvania. The mine has been idle for a number of years.

Association Activities

ILLINOIS COAL OPERATORS' ASSOCIATION at its annual meeting elected the following executive board: D. W. Buchanan, president, Old Ben Coal Corp.; D. H. Devonald, general superintendent, Peabody Coal Co.; George B. Harrington, president, Chicago, Wilmington & Franklin Coal Co.; Hubert E. Howard, president, Binkley Coal Co.; E. R. Keeler, president, Franklin County Coal Corp.; T. C. Mullins, president, Northern Illinois Coal Corp.; T. J. Thomas, president, Valier Coal Co.; A. H. Truax, president, Truax-Truax Coal Co.; William P.

QUALITY



PACKING

METALLIC & SEMI-METALLIC PACKING for MINE PUMPS

"The Packing that gets the Repeat Orders"

For deep mine pumps. Resists acid mine waters. Keeps grit out of stuffing box. Three types.

• MARLO ALL PURPOSE METALLIC PACKING

Best ever devised. Will not freeze at 70° below. Soft, pliant, like fibrous types, yet easier to handle. Won't cut, score or corrode moving parts.

• "TWIN-TWIST"

SEMI-METALLIC PACKING

Metal strands twisted with asbestos. Anti-frictional. Durable. Economical. Remarkable compressibility. Never hardens. For temperature up to 550° F.

• "RED WATER"

SEMI-METALLIC PACKING

Most modern development for all hydraulic applications. A solid-packing vegetable fibre combined with metal strands. Retains form under any conditions.

Let us serve you!

THE MARLO COMPANY
38 HOWARD ST.
NEW YORK, N. Y., U. S. A.

FOR SAFETY'S SAKE, SUPERIOR COUPLINGS



Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL COUPLINGS



PITTSBURGH
KNIFE & FORGE CO.

716 Chateau Street
N. S., Pittsburgh, Pa.

Young, president, Bell & Zoller Coal & Mining Co., with C. W. Peterson, treasurer, George F. Campbell, vice-president in charge of operations, Old Ben Coal Corp., was elected president, and Fred S. Wilkey, secretary.

British National Coal Board Plans Work Under Six Heads

Great Britain's National Coal Board at its first meeting on Dec. 18 divided its work into six sections, appointing a subcommittee for each. The board was named in accordance with the government's plan to control production and consumption of coal described in a White Paper (Cmd. 6364) issued June 3, 1942 (Coal Age, August, 1942, p. 46). The subcommittees are to handle the following problems:

1. General planning of production, including allocation of district and regional quotas, the best means of securing the highest efficiency of the industry, and any improvements in machinery or methods of operation whereby output may be increased.
2. Provisions of supplies, equipment and materials for the conduct of mining operations.
3. Matters relating to the maintenance of manpower and labor productivity, including enrollment of new men and the instruction, training and advancement of boys and youths.
4. All matters affecting the welfare of mine workers, including housing, transport and feeding facilities, questions of health and safety, and, in particular, such occupational diseases as silicosis and nystagmus, with a view to providing all possible preventive measures, clinical treatment and rehabilitation.
5. Consumption of coal.
6. The output bonus scheme.

Armco Buys Colcord Operations

Seeking to expand its coal byproducts reserves, the American Rolling Mills Co. has purchased the Colcord Coal Co.'s three mining operations in Raleigh County, West Virginia, which produce an estimated \$40,000 tons of coal annually. J. B. Miller, of Ashland, Ky., will head the new organization, with these other officers: Charles Conner, first vice-president; F. C. Colcord, second vice-president; M. B. Brawley, of Middletown, Ohio, treasurer, and W. D. Virkis, of Middletown, secretary.

Trade Literature

AUTOMATIC CONTROL INSTRUMENTS—Bristol Co., Waterbury, Conn. Series of bulletins covers automatic control and recording instruments for industrial furnaces, dryers, kilns and ovens—bound together in loose-leaf form so that additions and revisions may be easily inserted. The set covers pyrometer recorders and controllers, thermometer recorders and controllers, humidity recorders and controllers, draft controllers, control valves

MOSEBACH RAIL BONDS

Are Flashwelded

This method of welding assures maximum conductivity to maintain high voltage at the face. The result is less power loss, and stronger, more oxygen-free welds made possible by an absolute connection between the forged steel terminal and each strand of copper cable.

TYPE M8-F

M8-F . . . Designed to permit straight line welding. The extra pocket in the terminal increases the welding area 15%, lowers resistance and saves you money. Can be applied to top or bottom of rail.



TYPE M5-F

M5-F . . . The outer ledge of terminal M5-F affords extra welding area, makes welding easier and faster. This bond can be used on the top of any size rail base.

Mosebach manufactures many types of rail bonds. Write for information about the type most suited to your particular application.

MOSEBACH

ELECTRIC & SUPPLY COMPANY
1115 Arlington Avenue
Pittsburgh, Pa.

*LONG-CONTINUED SATISFACTION
Brings Repeat Order!*

This DE LAVAL

WORM GEAR of 32½ ratio was installed in a coal handling plant in 1928 to transmit 40 h.p. to drive an apron conveyor. Recently the owners bought three more De Laval worm gears, two of them for conveyor drives.

Continuous operation in an atmosphere laden with abrasive dust or moisture has no terrors for a De Laval gear, which is self-contained and self-lubricating and requires no attention further than an occasional checking of the oil level.

Process plants find in mechanical conveyors with De Laval worm gear drives a superior and economical means for moving materials steadily in large quantities over long distances.

Our engineers will be glad to study your requirements and to assist with data and layouts. Ask for Publication W-1133.

DE LAVAL WORM GEAR DIVISION
of the De Laval Steam Turbine Co., Trenton, N. J.

and accessories; illustrated with halftones, application drawings and wiring diagrams.

BRAKE SERVICE—Bendix-Westinghouse Automotive Air Brake Co., Ohio. Bulletin 1041 describes features and operation of Bendix-Westinghouse air brakes for use on trucks, tractors and trailing units. Bulletin 1047 tells how to keep trucks rolling with the B-W repair exchange service, which permits exchange of a worn unit of the air brake system for a factory reconditioned unit upon payment of a standard flat rate charge.

CARE OF CENTRIFUGAL PUMPS—Allis-

Chalmers Mfg. Co., Milwaukee, Wis. Handbook makes specific recommendations for putting pump care on war-time basis. Tips included describe: How a change in liquid can blitz a pump, easy ways to find leaks, common mistakes in packing stuffing boxes, how tight is "too tight" for a gland, how to figure head, how to protect pumps against cavitation, the vital role of water as a lubricant in pumps, quick diagnosis of pump ills, and many others.

CIRCUIT BREAKERS — Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Booklet DD-29 060 describes complete line of Nofuze "De-ion" circuit breakers

for lighting, distribution and power circuits up to 600 amp., available for panelboards, switchboards, built-in applications, individual mountings and separate inclosures. Principles of the "De-ion" arc quenching action are explained with quick facts on design and operation of each breaker. Special attachments are described, including the shunt trip, under-voltage release, auxiliary switches and bell-alarm switches.

COAL-HANDLING MACHINERY — Robins Conveying Belt Co., Passaic, N. J. Bulletin 121 describes Robins Mead-Morrison coal-handling equipment, including bridges, both rope and man trolley systems; towers, special rigs, grab buckets, car dumpers, car hauls, barge hauls, rail clamps and cable railways.

DUSTPROOFING COAL—Johnson-March Corp., New York City. Bulletin 100-C tells what Coaladd is and what it does, its component parts having been formulated into three distinct compounds to meet the varying dust-treating requirements of different coal seams.

RAILWAY TRACKWORK—Weir Kilby Corp., Cincinnati and Birmingham. Catalog H, which supersedes Catalog G, shows a variety of standard designs in trackwork for use by mines and other industrial plants as well as railroads not confined to their own special plans. The catalog is arranged in divisions, each devoted to one product, such as frogs, switches, guard rails, switch stands, crossings, etc.

PROFESSIONAL SERVICES

Consulting	Specialists	Plant Design
Engineering	Geologists	Operation
Examinations	Reports	Construction

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ENGINEERS AND BUILDERS OF
MODERN COAL OPERATION
Authoritative Valuations and Reports of
Mining Properties, Equipment and Opera-
tion.
332 S. Michigan Ave., Chicago
120 Wall Street, New York, N. Y.

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Consulting Engineer
Mining Reports, Appraisals and Power Surveys
Engineering Management of Coal Mines
Automotive Gathering System
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Telephone—Harrison 5151
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Valuation, Mine Mechanization and Coal
Preparation.
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Consulting Engineer
COAL PREPARATION
To Yield Maximum Net Returns
Face and Product Studies
Plant Design and Operation
Coal Sampling
Kanawha V. Bldg. Charleston, W. Va.

COAL MINE MANAGEMENT, INC.

WILLIAM TAYLOR, President
Guardian Bldg. P. O. Box 837
Cleveland, O. Denver, Colo.
Complete coal company management
Modernizing and mine mechanization

C. C. MORFIT

Consulting Engineer
Mine Operation, Management
Valuation
11 Broadway, New York

EDWARD V. D'INVILLIERS ENGINEERING CO.

GEOLOGIST AND MINING ENGINEERS
Specialist in examination and valuation of bitu-
minous coal properties; Investigations of operating
conditions, costs and markets; development of min-
eral resources.
Private records covering 40 years of professional
activity in coal fields of United States and Canada.
121 N. Broad St., Philadelphia, Pa.

Stuart, James & Cooke, Inc.

ENGINEERS
Coal plant design, construction, supervision and
operation. Operating cost surveys and analysts,
Power surveys and electrifications. Examinations
and valuation of coal properties.
52 William St. Hibbs Building
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Mining Engineers
Coal Operation Consultants
Valuations
Koppers Bldg. Pittsburgh, Pa.

L. E. YOUNG

Consulting Engineer
MINE MECHANIZATION
MINE MANAGEMENT
Oliver Building — Pittsburgh, Pa.

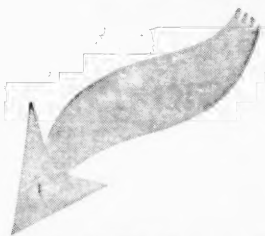
Anthracite Industries Expands To Meet New Problems

Methods of handling the problems growing out of the fuel-oil shortage bulk large in the scope of work recently announced by Anthracite Industries, Inc. Since Nov. 1, 1942, among other things, the organization has set up schools to show retailers how to handle service problems and save gasoline and tires. The publicity campaign on how to burn anthracite has been enlarged through increased advertising and news articles reaching the consumer. N. W. Ayer & Son, Inc., Philadelphia, has been commissioned to handle the organization's advertising, public relations, marketing and educational programs.

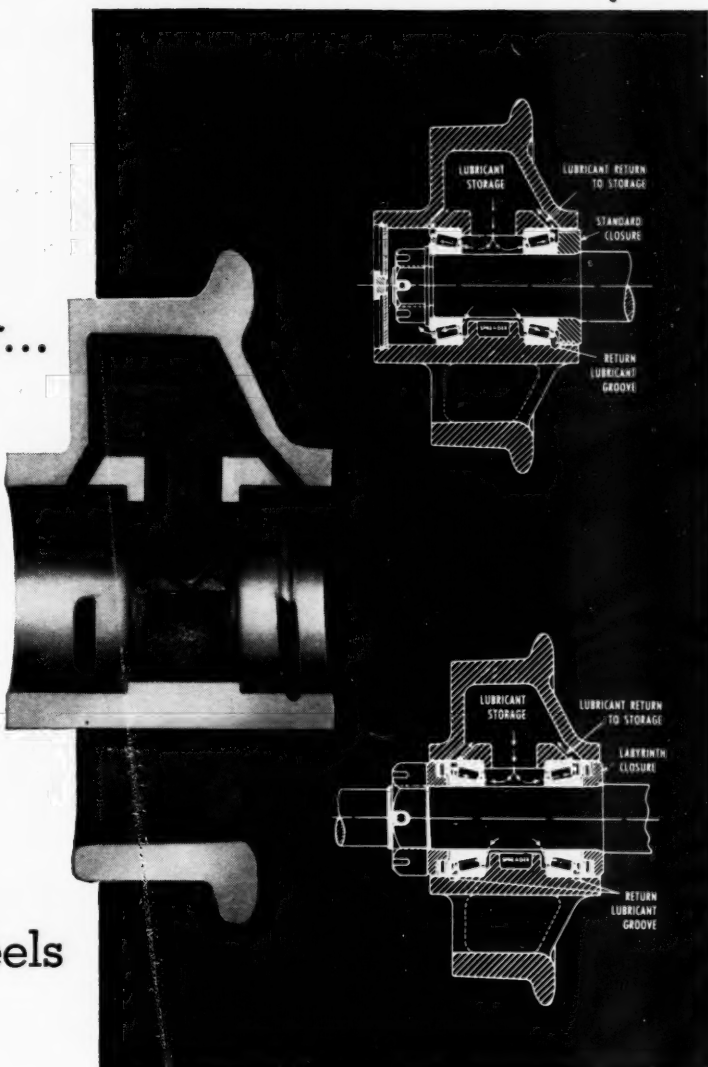
Cooperation with the public and representatives of the Federal Government in assisting New England to meet its fuel problems has been a major phase of recent activities, including opening the Boston (Mass.) showroom to an exhibition of grates, boilers, space heaters, water heaters and available conversion material Jan. 25. On the same date, an anthracite home-heating display was inaugurated in New York City's Pershing Square Information Center. New customers are being provided with "Victory" firing charts, and a new folder on anthracite for home fireplaces has been issued for distribution by dealers. In addition Anthracite Industries, Inc., is working with the armed services on the use of anthracite and with government representatives on distribution.

They stay in service longer...

they **lubricate**
themselves...



Hockensmith "Oilspok" Wheels



"Oilspok" Wheels last longer because they reduce excessive tread wear, caused by churning resistance of heavy greases. "Oilspok" Wheels rotate freely . . . and one greasing lasts *several years*. Lubrication is constant and positive . . . and there is no loss of oil due to bearing pumping pressure or air expansion.

Each hollow spoke of "Oilspok" Wheels has three ports leading into the hub—one large central port and two narrow rectangular ports,

situated at the outside of each bearing. The diamond-shaped spreader, cast integrally with the hub, forces the excess lubricant clinging to the axle into the bearing, from which it is thrown by centrifugal force back again to the storage spokes or reservoirs. "Oilspok" Wheels are made for plain or roller bearings.

Make sure you get the best in mine car wheels. Get "Oilspok" Wheels and save money. Write for full information.

CONSTRUCTION FEATURES

CORRECT DESIGN. Hockensmith "Oilspok" wheels are designed with correct proportioning of the tread, hub, and spokes for maximum strength with an ample margin of safety.

CAREFUL METALLURGY. Cast from a special alloy to insure deep chilling, strength, and toughness.

SKILLED MOULDING. Cast in machined chills, producing a *round* wheel and *smooth* tread—little brake skidding or rolling friction on the rail.

CONTROLLED ANNEALING. Internal strains are eliminated by carefully controlled annealing in soaking pits located in the foundry floors so wheels reach them immediately after the iron has solidified.

PRECISION MACHINING. Specially designed machines insure tread being concentric with the bore, and hubs being machined to exact limits—important steps in the manufacture of a *good* wheel.

Hockensmith

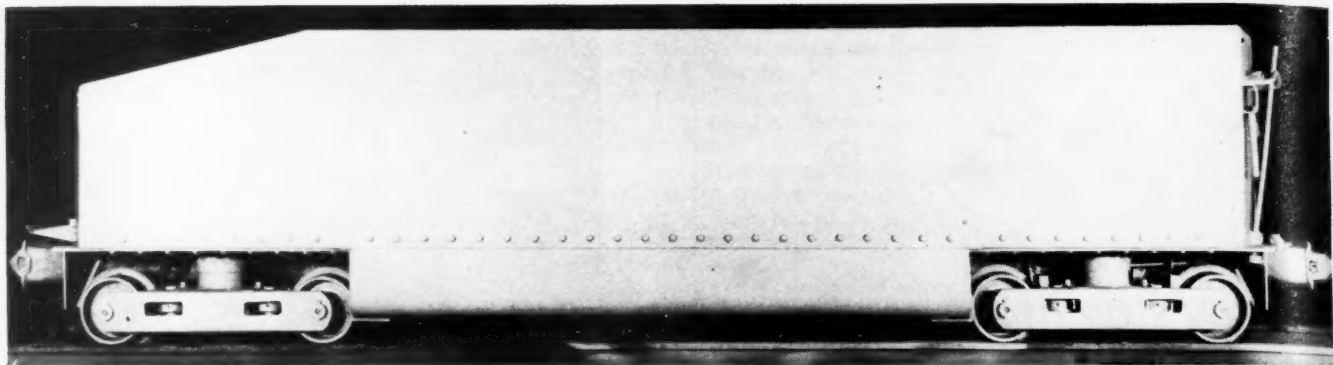
Wheel & Mine Car Company

Established 1877

PENN, PA.

Long Distance Phone, Jeannette 700

OIL IS AMMUNITION, USE IT WISELY

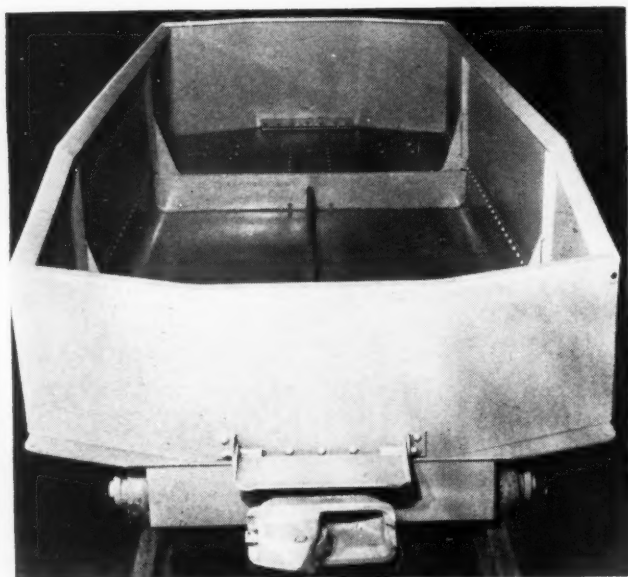


TRANSPORT YOUR COAL

in large packages . . .

DIFFERENTIAL

provides maximum capacity

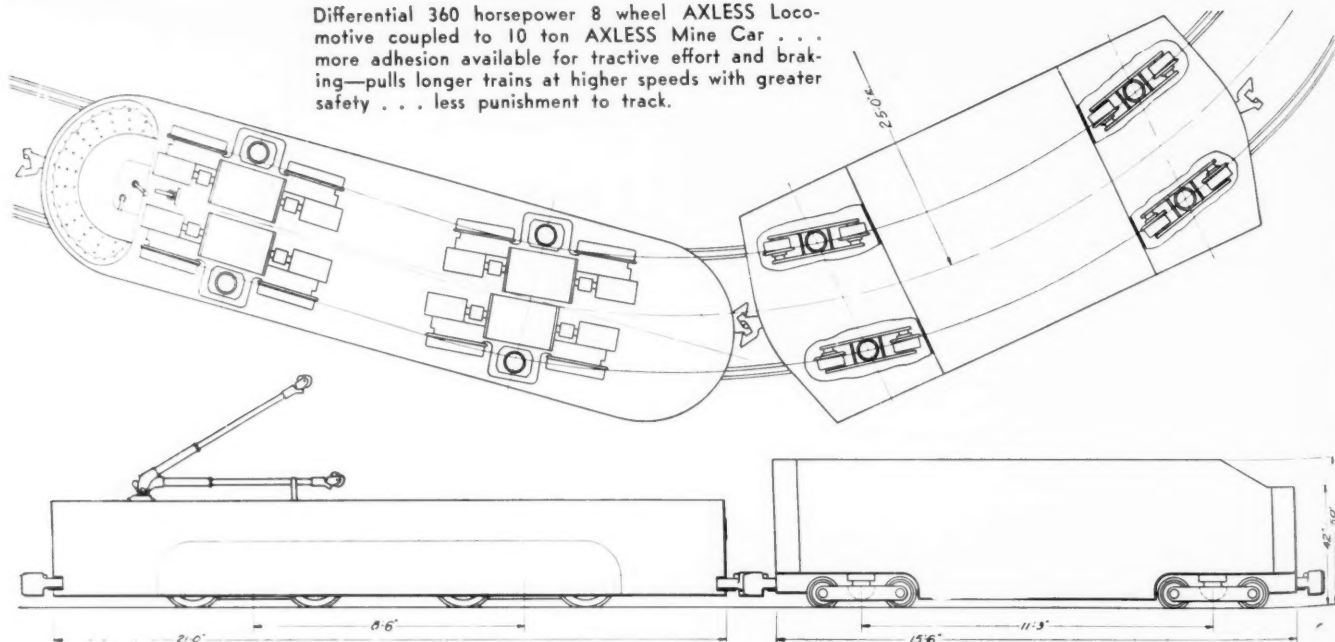


Here's a low height, large capacity car that may be used most economically behind a loading machine. Less time is lost through car changes and fewer cars are required. Smooth interior offers no pickets for coal to pack in when dumped.

Eight-wheel axless trucks assure better roadability, fewer derailments, less wear and tear on track and definite savings in power.

Write for full descriptive bulletin

Differential 360 horsepower 8 wheel AXLESS Locomotive coupled to 10 ton AXLESS Mine Car . . . more adhesion available for tractive effort and braking—pulls longer trains at higher speeds with greater safety . . . less punishment to track.



DIFFERENTIAL STEEL CAR CO., FINDLAY, OHIO

This Experienced Miner
is Not Replaceable...
and Neither Are His Eyes

That's Why
**HE NEEDS
AO GOGGLES**

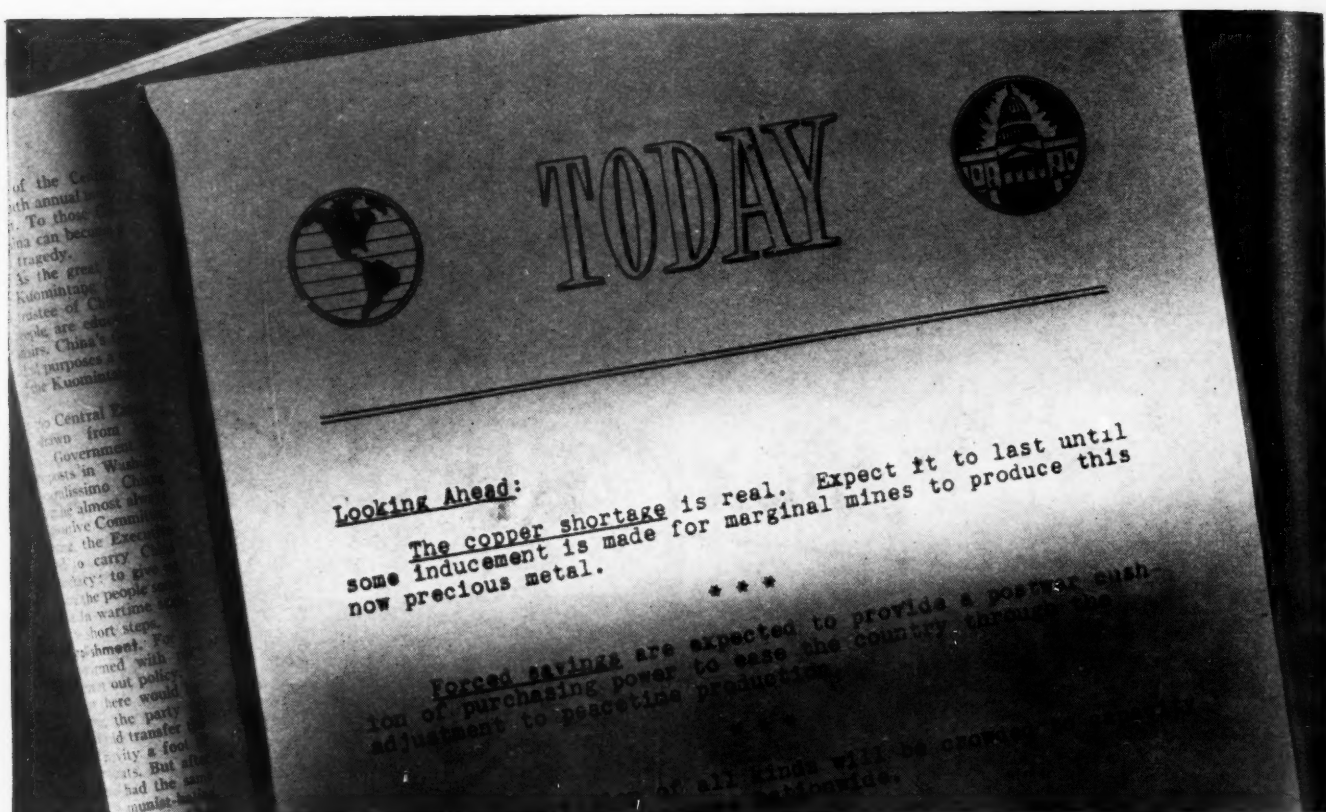
Here is straight talk about the seriousness of eye accidents in coal mines. The *action* is up to you.

Every miner who goes to work without goggles runs the risk of suffering an eye injury which will not only be very expensive to the property which employs him . . . but will also help to delay Victory by robbing our country of the services of an irreplaceable worker.

Don't take a chance of letting eye accidents strike down *your* miners. American Optical Company, through Mines Safety Appliances Company, offers you a complete line of goggles that are comfortable to wear. Equipped with Super Armorplate Lenses, these goggles provide maximum possible resistance to impact. Call in your M. S. A. Representative today.

American  Optical
COMPANY
SOUTHBRIDGE, MASSACHUSETTS

REPRESENTED IN THE COAL MINING INDUSTRY BY MINE SAFETY APPLIANCES COMPANY, PITTSBURGH, PA.



GOULD KATHANODE'S new type connectors deliver full current load for shuttle cars and locomotives



RATED CONSERVATIVELY—Goulds will equal or exceed in capacity any battery of comparable size and cell structure. Buy on proven performance and you will buy Gould!

YES, copper is scarce—but that's a problem that Gould engineers have licked. The connectors on the Gould Kathanode you buy today consist of lead of heavy cross section which delivers the same high voltage and performance as copper. Admittedly not as desirable as pure copper—the important thing is, they do the job. If you need a new battery, don't let the copper shortage stop you.

But first make sure you are getting the most out of your present Gould Kathanode. Its spun glass construction introduced by Gould to American industry doubles battery life—which means that Gould Kathanode will last twice as long as ordinary batteries lacking this feature.

FREE HELP ON BATTERY PROBLEMS—Your Gould Service Man will help you get full service from your present equipment, regardless of make. No charge, no obligation. Write Gould Storage Battery Corp., Depew, N. Y. Ask for FREE descriptive literature on any type of industrial installation.

GOULD

THE BATTERY PICKED BY ENGINEERS



"Harnimoly" just joined up!

Which is by way of saying that this P&H special purpose molybdenum electrode won't be back 'till the war's over. Because its uses were less vital than others, we could no longer give it a deferment.

"Harnimoly's" place in our production will be taken by other P&H Alloy Electrodes more urgently needed in wartime service. These include types for hard surfacing, resistance to wear, impact and abrasion; for welding stainless steels, 4-6% chrome steels, armor plate, etc. To join in hastening the day of Victory, P&H is supplying electrodes in unprecedented volume to vital war-time industries.



**P&H-Hansen Square Frame WELDERS
Are Speeding War Production, Too!**



*A New Star Has Been
Added to P&H's
Army-Navy "E".*

General Offices and Factory: 4540 W. National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER

CORPORATION

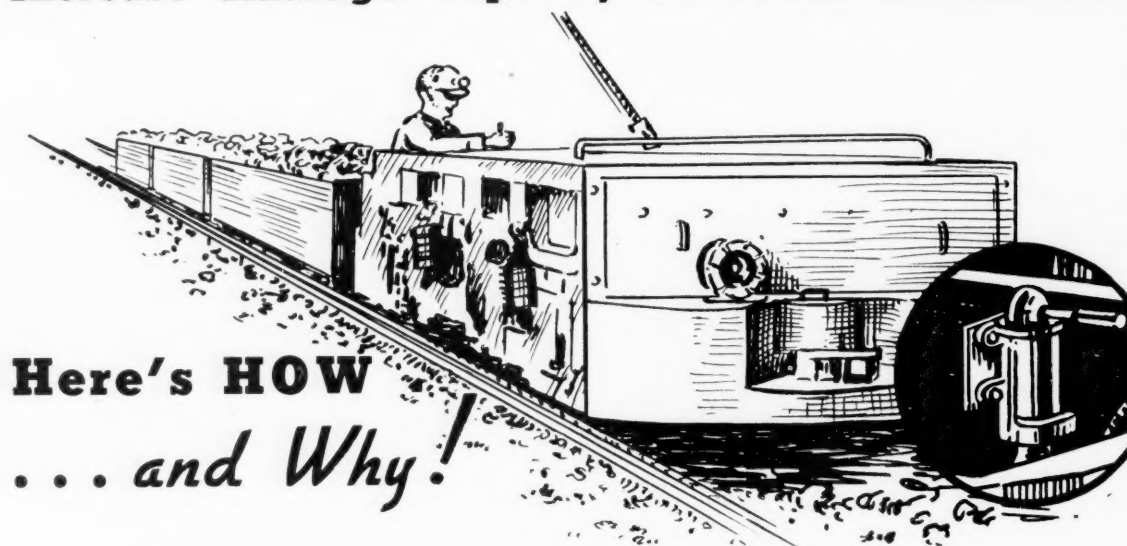
WELDING ELECTRODES • MOTORS • HOISTS  ELECTRIC CRANES • ARC WELDERS • EXCAVATORS

Canadian Distribution: The Canadian Fairbanks-Morse Company, Ltd.

Westinghouse

HYDRAULIC BRAKES

Increase Haulage Capacity of Small Locomotives



Here's HOW

... and Why!

Quicker stops and slow-downs than with hand brakes.

Instant response, effortless manipulation, ample power.

More loaded cars kept rolling, more trips made.

Available braking for heavy loads, higher speeds.

Quicker spotting of cars at mechanical loaders.

Fast, flexible action permits quick stops and starts.

Time-saving descent on all grades with uniform safety.

Adequate braking on tap safeguards freer running speeds.

Less time out for maintenance, greater availability.

No need for motor "bucking" or dragging brake shoes.

Tandem operation of locomotives is facilitated.

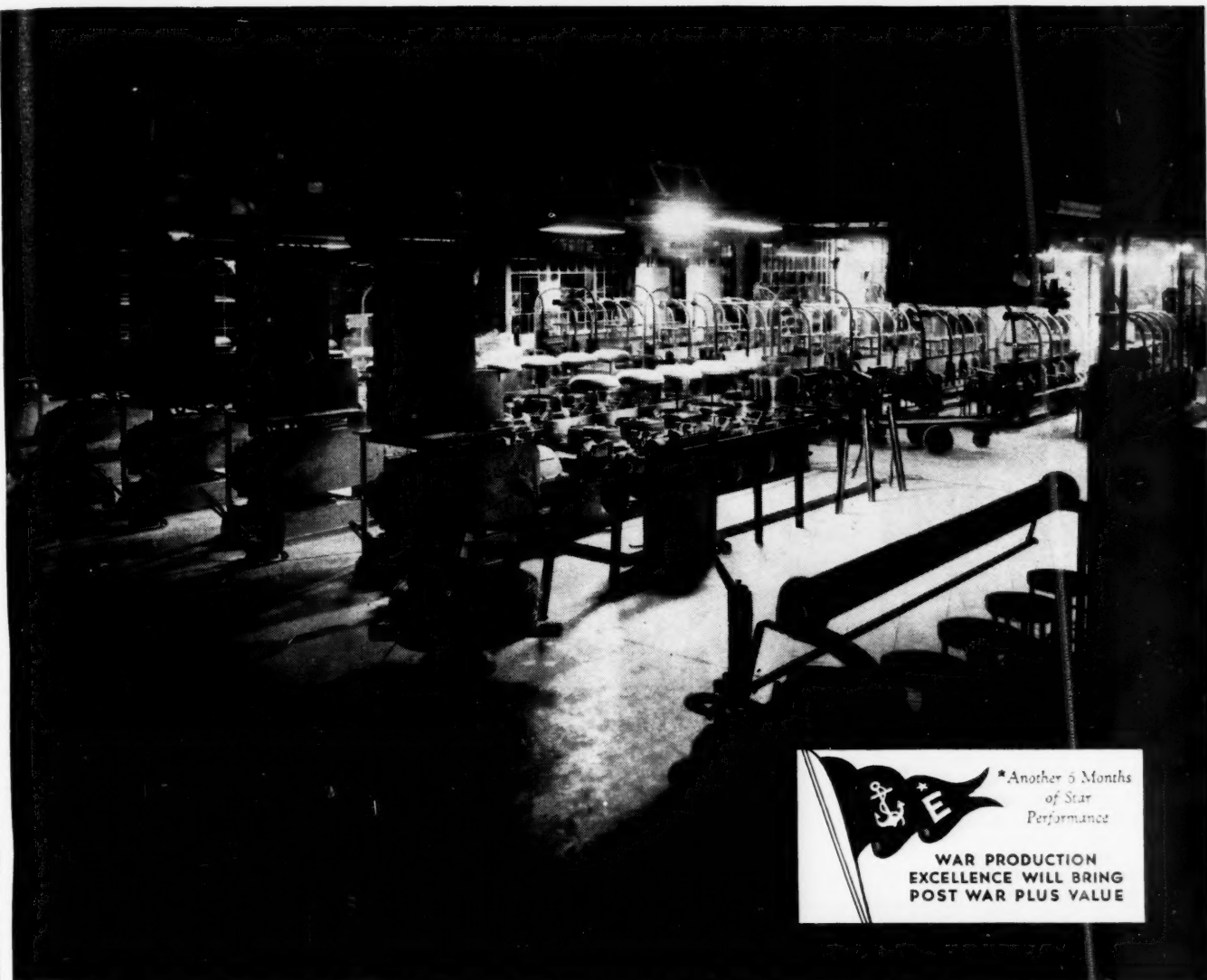
Brakes on both controlled by valve on leading unit.

This equipment is a simple, compact system easily installed
on small locomotives, new or old.

Complete information and prices furnished upon request.



Westinghouse AIR BRAKE CO.
Industrial Division
PITTSBURGH, PENNSYLVANIA



PULLING WIRES FOR PEACE!

Mile after mile of wires are being processed to speed the war effort and to hasten peace.

Day and night, the finest of steel passes through scientifically-controlled patenting furnaces, steaming vats that clean and coat, and baking ovens that dry and degasify. With unrivalled skill, through dies of jewel-like precision, it is drawn down to wire.

With scarcely a pause, spools of it in great numbers are cradled in the awesome whirr of robot-like stranding and laying machines. There, just as steadily as they were drawn down, wires are laid up again, first into strands and then into rope. In each process, strength is gained to supply tough, flexing sinews for machines which multiply and quicken man's capacity ten thousandfold.

SEND FOR ROPE DOPE • Tells how to make wire rope last longer—how to handle and install it—how to socket or splice—and a wealth of other helpful information. Engineering information supplied without obligation.

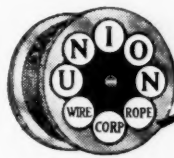
WHEN YOU NEED PREFORMED WIRE ROPE
SPECIFY **union-formed**

As never before, with ever-increasing skill, our craftsmen are producing tough steel tendons for fighting machines. Before there can be war machines, however, ores, oil, coal and stone must be mined. Steel and metals must be made, lumber logged, war plants constructed and fitted. Then there must be highways, seaports and airports hewn out of the earth around the globe.

Think! Try to imagine what a limitless, hopeless, man-killing job it would be without modern wire rope to do the digging, shoveling, hoisting and countless other burdensome tasks. Then resolve to use your wire rope with great care.

UNION WIRE ROPE CORPORATION
2130 Manchester Ave., KANSAS CITY, MO.

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union

Wire Rope

"THE ULTIMATE LOW COST WIRE ROPE"



Enlarged reproduction free on request

Servant of Freedom

Mighty servant of all America is the Construction Industry. Its strength is the strength of our great quarries, mines and forests. Its driving power comes from our extensive oil wells and factories . . . and from the minds of men who dream of making an ever better world.

Now during war, Construction marches only against the enemy . . . but with Victory, Construction will again bring progress in its train.

Already the Construction Industry has brought us vast networks of highways, bridges and airports—to help free men from barriers of distance, time and transporta-

tion costs . . . massive dams are making low-cost electricity available to more and more millions, lifting old burdens . . . vast aqueducts and sanitation systems are contributing to our people's health.

With the return of peace, Construction will bring in its train ever new and greater contributions toward the better life for all.

★ ★ ★

Wickwire Rope is proud of the privilege of helping the Construction Industry in its engineering accomplishments . . . in quarries, on highways, in the building of dams, bridges, and structures of all kinds.

A CHALLENGE

The present shortage of steel, and of wire rope, challenges each member of the Construction Industry to make each length of wire rope now in service last longer than ever before. Every man who uses or handles wire rope can help.

We will be glad to furnish free copies of the helpful book "Know Your Ropes," which pictures the right and wrong ways to use wire rope. **TAKE UP THE CHALLENGE—WRITE FOR YOUR COPY—AND MAKE SURE ANY NEW MEN KNOW THE RIGHT WAYS.** . . . Address Wickwire Spencer Steel Company, 500 Fifth Ave., New York, N. Y.



WICKWIRE ROPE

Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City





Here Is *Why* the Belts You Use Should be Built with the **CONCAVE SIDE !**

A very simple test (pictured above) will show you the great importance of the Concave side. To make this test, take *any* V-Belt and bend it as it bends in going around its pulley. With your fingers, grip the sides of the bending belt. You will feel those sides *change shape*. Fig. 1, (on the right) shows what this shape-change does to a *straight-sided* V-Belt. Note the out-bulge of the sides.

Now look at Figure 2. There you see how *differently* the same shape-change affects a V-Belt built with the patented Concave side. The Concave side merely becomes straight—and this makes the bending belt exactly fit its sheave groove. There is no side-bulge. This means that wear is distributed *evenly* over the *whole side* of the belt—insuring longer life! Also, the whole side of the belt uniformly grips the sheave wall. This means heavier loads are carried without slippage—a real saving in belts—which conserves one of the nation's vital resources—rubber!

Only belts built by Gates are built with the Concave side, a Gates patent.

What Happens
When a
V-Belt Bends



FIG. 1



FIG. 2

431

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

Chicago, Ill.
549 West Washington

New York City
215-219 Fourth Avenue

Atlanta, Georgia
738 C. & S. Natl. Bk. Bldg.

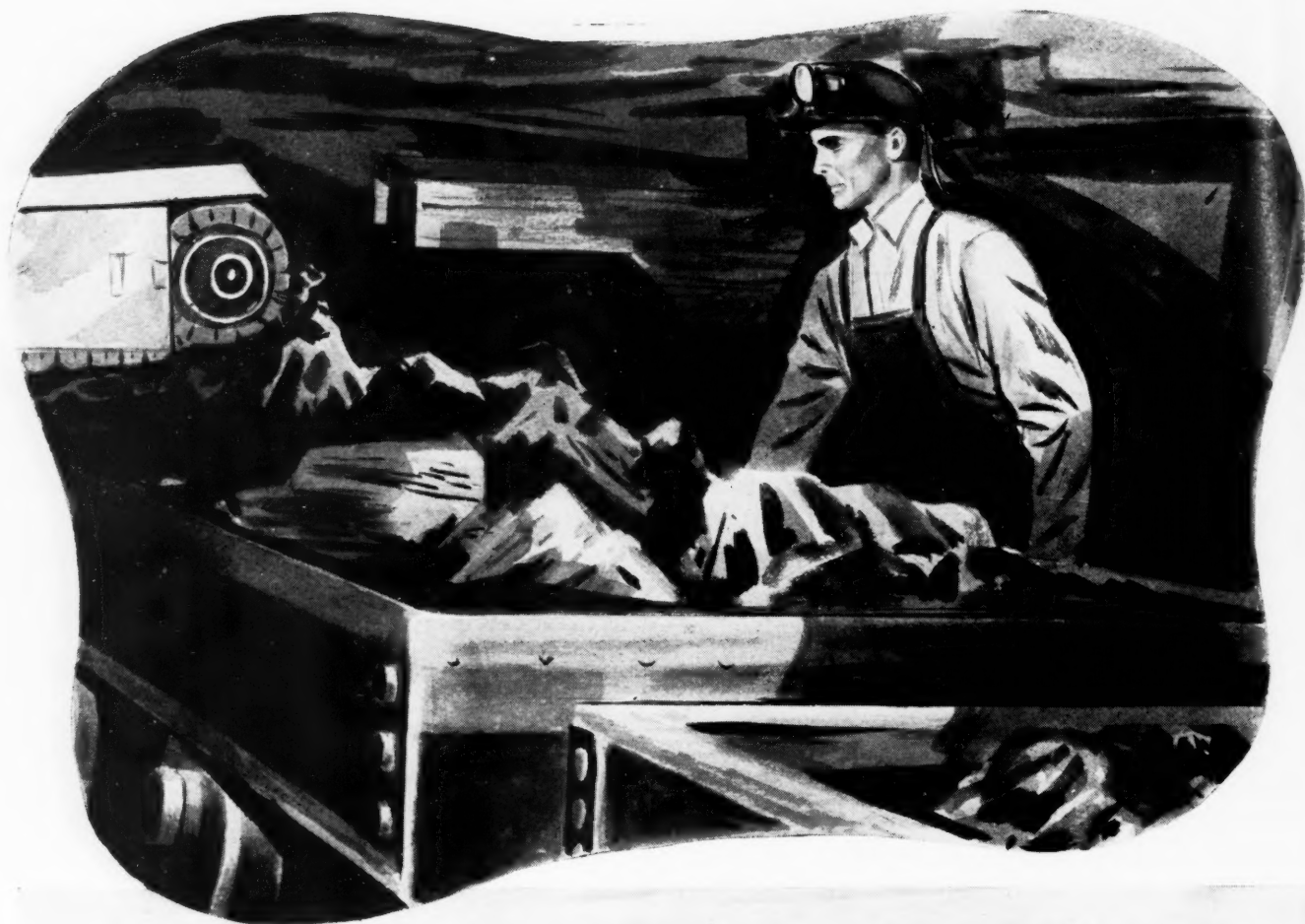
Los Angeles, Cal.
2240 East Washington Blvd.

Denver, Colo.
999 South Broadway

Dallas, Tex.
2213 Griffin Street

Portland, Ore.
333 N. W. 5th Avenue

San Francisco, Cal.
1090 Bryant Street



More tonnage of better-broken coal HERCULES PERMISSIBLES

Even in the middle of a drive for more production, it's worth while to check up and make sure you're using the permissible that will give you the most coal in the right sizes.

Whether you want more lump or more fines; whether you're shooting for hand loading or mechanical loading; there is a Hercules Permissible that will shoot your coal the way you want it.

Our advice and assistance in selecting the permissible best suited for different veins has increased the tonnage of properly-broken coal in many mines. The table, at right, will give you a general idea of the types of Hercules Permissibles available. A word from you will bring more detailed information.

HERCULES PERMISSIBLES		
	Approximate No. of 1 1/4" x 8" Cartridges per 100 lbs.	Cartridge Strength— Percent
<i>For Lump Coal</i>		
Red H*C	276	29.5
Red H*D	316	22
Red H*F	356	13.5
Hercoal* C-1	400	Less than 5% About same cartridge strength as black powder
Hercoal* D	450	
Hercoal* F-1	500	
<i>For Rock or Fine Coal</i>		
Red H*B	280	32
Collier C*	320	21
<i>For Wet Work</i>		
Hercogel* A	200	48
Hercogel* 2	240	46

* REGISTERED U. S. PATENT OFFICE

B-40

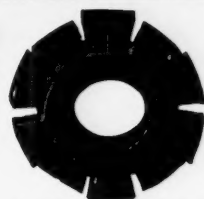
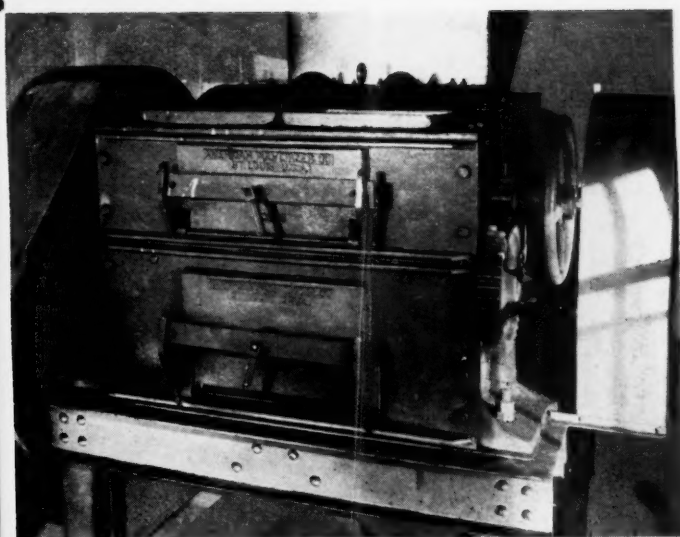


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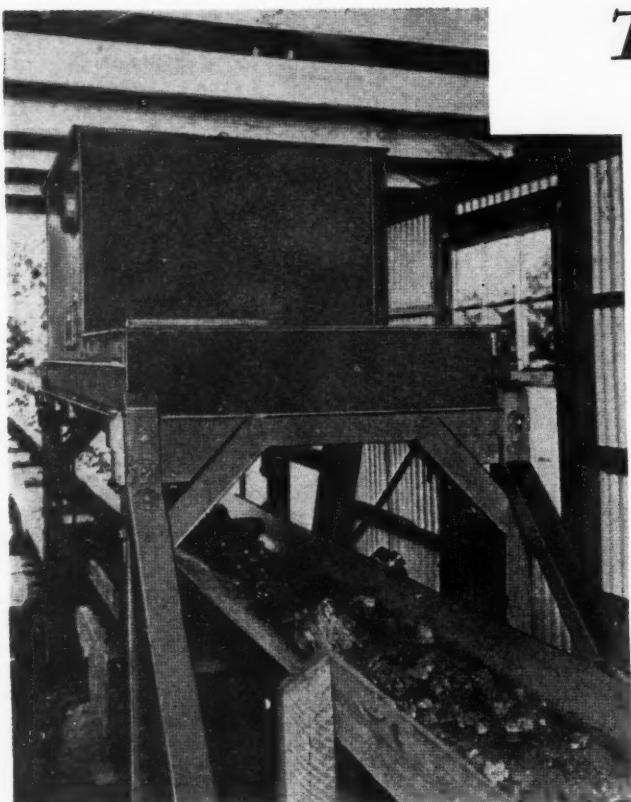
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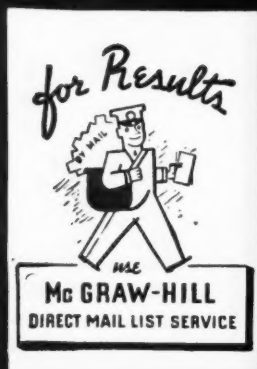
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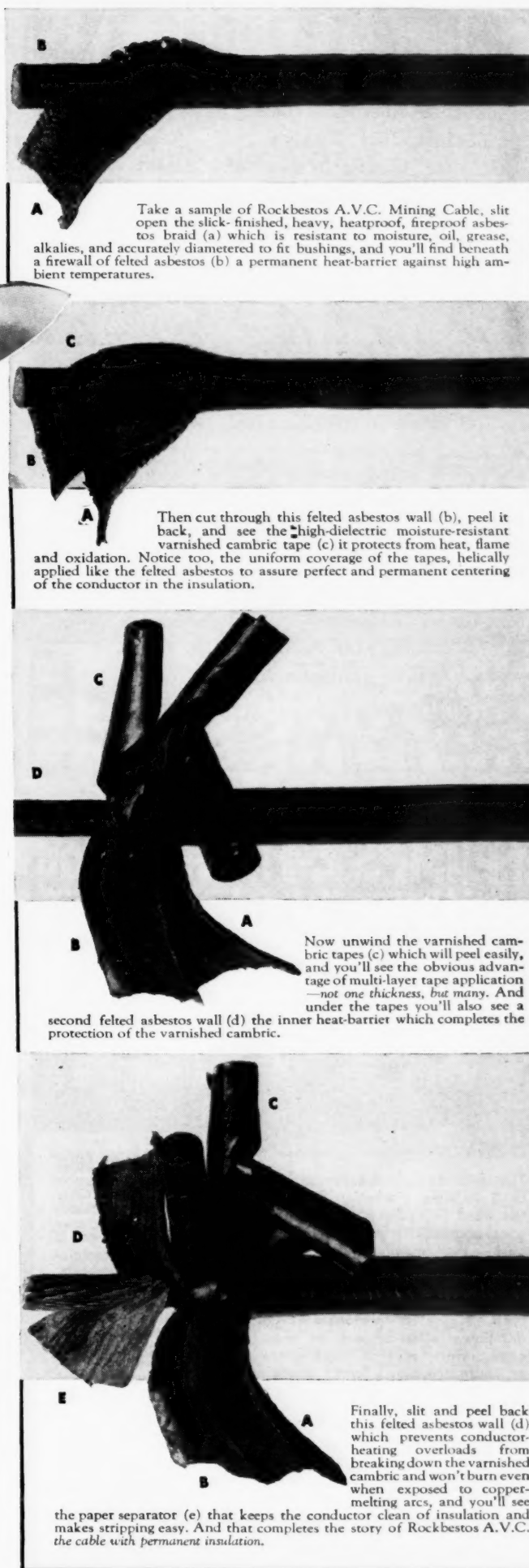
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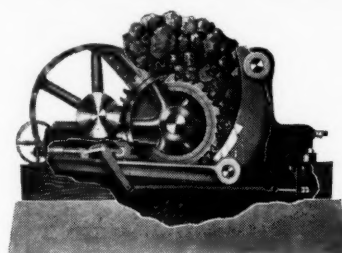
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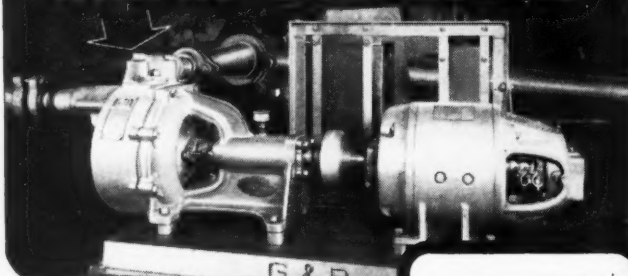
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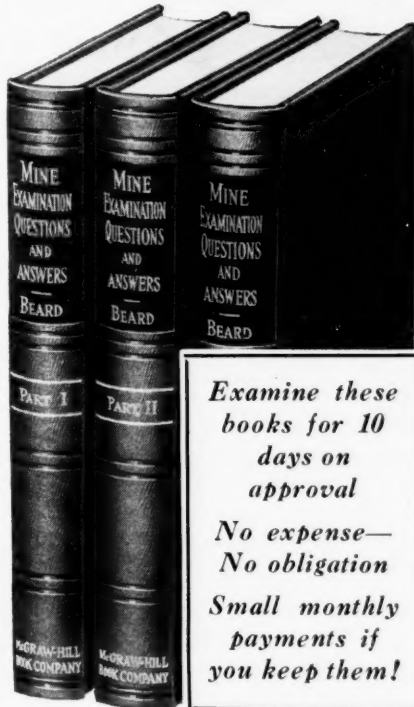
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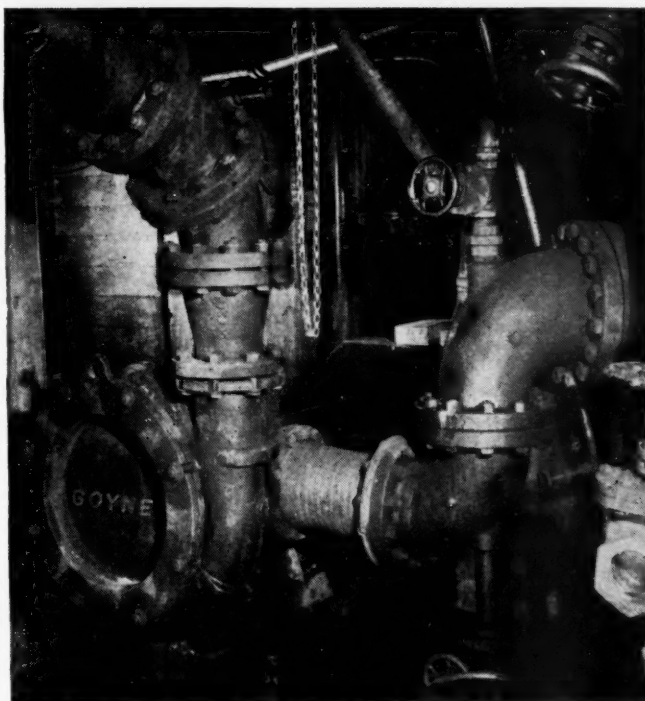
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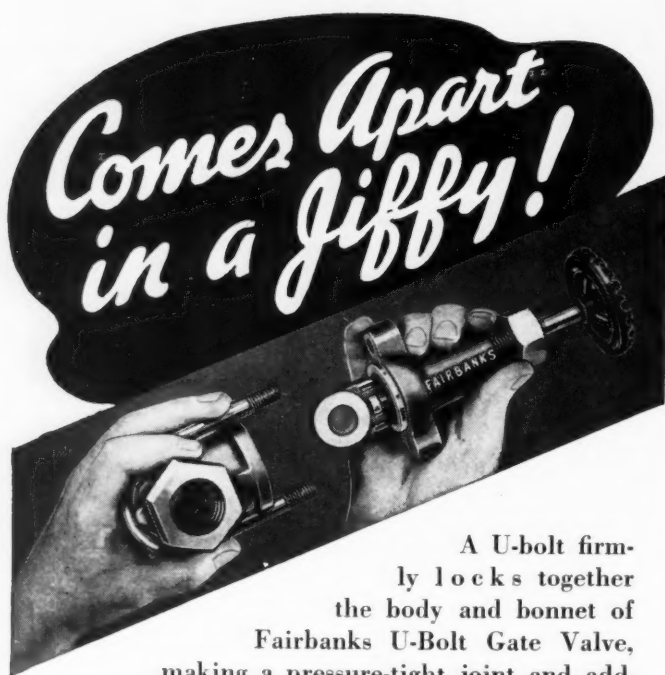


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in a jiffy!*

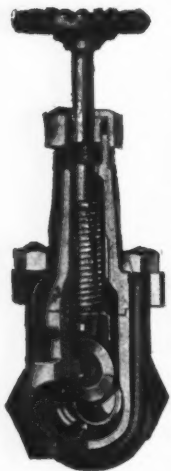
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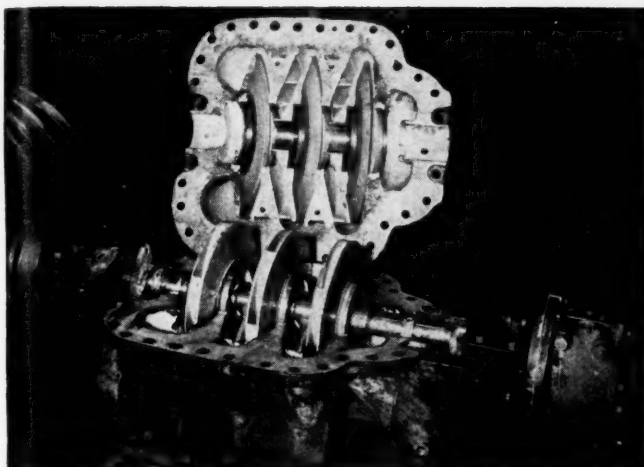
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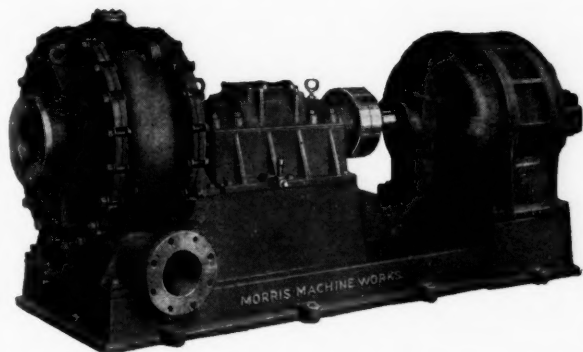
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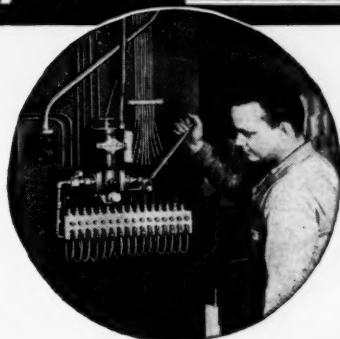
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SPEED REDUCERS

1—3 HP. Farrel-Herringbone double reduction ratio 6 to 1.
1—5 HP. Boston single reduction ratio 9.25 to 1.
17—8 HP. Tate Jones worm gear 36 to 1 ratio.
3—10 HP. D.O. James spur gear 840 to 30 rpm.
7—10 HP. Horsburg double reduction ratio 6 to 1.
2—20 HP. Sturtevant ratio 14.5 to 1.
5—69 HP. Poole Eng. Co. 5½ to 1 ratio.
1—150 HP. Falk Co. ratio 7.51 to 1.
1—450 HP. Kerr Reduction 3800 to 720 rpm.
1—150 HP. R.D. Nuttall ratio 1.6 to 1.

M. G. SETS—SYNCHRONOUS

200 kw. West. 600 v. DC 600 rpm, 220/3/60.
150 kw. West. 275 v. DC 600 rpm. 2300/3/60.
125 kw. Cr. Wh. 250 v. DC 1200 rpm. 220/440/3/60 Ind.

A.C. GENERATOR—3 ph.

60 cy.
219 kva. G.E. 2200/440/220 v. 200 rpm.

HOISTS

25 HP. Thomas 18" face 20" dia.
40 HP. Single drum AC 220/3/60.
100 HP. Lidgerwood 2 drum AC or DC Motor.

CENTRIFUGAL PUMPS

4x3 Harris, 320 rpm.
4x4 Weinman, 500 gpm.
6x6 Gould, bronze, 1300 gpm.
8x8 Weinman, bronze.
5x6 Hayton, 750 gpm.
6x6 Manistee, 750 gpm.
6x6 American, 1000 gpm., bronze.
6x6 Weinman, 1000 gpm.

ENGINE GENERATOR SETS

50 kw. 250 V. D.C. Generator direct connected to International Diesel Engine.
50 kw. West. 220/3/60 Ames STEAM
75 kw. G.E. 220/3/60 Bessemer GAS.
75 kva. Allis Chal. 220/3/60 dir. con. 14x14 Steam Engine.
80 kw. West. 250 V. Belted 110 Bessemer GAS.
225 kw. Elec. Machy. 2300/3/60 Ideal STEAM.

TURBINE

1—Kerr Steam Turbine 450 BHP 3800 rpm., 5" intake 12" exhaust with Kerr Reduction Unit 3800 to 720 rpm., 115# pressure.
1—1000 kw. G.E. Turbo 6600/3/60 150# Pres.

SLIPRING MOTORS—3 ph. 60 cy.

No.	HP	Make	Type	Volts	Rpm
1	1500	Allis. Chal.	ANY	2200	485
1	700	G.E.	MT-432	2200	393
1	400	West.	CW	2200/550/2-0	435
1	400	West.	CW-967A	220-440	1170
1	300	G.E.	I-M	220-440	600
1	260	Burke	EMV-65	220-440	600
3	250	G.E.	I-M	550	600
3	250	G.E.	I-M	2200/220/440	600
3	200	G.E.	I-M	2200/220/440	600
1	200	G.E.	I-M	2200	514
1	200	West.	CW-956A	2200	690
1	150	G.E.	I-M	220/440	900
1	100	West.	CI	220/440	1750
1	75	West.	CI	220/440	860

SQUIRREL CAGE MOTORS—3 ph. 60 cy.

HP	Volts	Make	Type	Speed
500	2200/440/220	West.	CS	720
400	2200/440/220	West.	CS	500
450	2200/440/220	West.	CS	600
400	2200/440/220	West.	CS	600
350	2200/440/220	West.	CS	450
300	2200/440/220	West.	CS	400
200	2200/440/220	West.	CS	250
200	220/440	West.	CS	580
200	2200	West.	CS	870
150	550/220/440	G.E.	—	575
150	220/440	G.E.	KT-562	690

SCALES

6—Fair. Morse #11½ 3 beams (2—200# ea. 1—50 lbs.) platform 16¼ x 21½.
9—Howe Scales 3 beams—platform 14½x22.

DUQUESNE ELECTRIC & MFG. CO. . . . PITTSBURGH, PA.

FOR SALE

50 ORE CARS

CAPACITY 100,000 POUNDS

30—Arch Bar Sides 20—M.C.B. Equipped
Wrought Steel Wheels
Recently removed from service

AVAILABLE FOR IMMEDIATE DELIVERY



Steam and Electric Locomotives; Passenger, Baggage, Mail and Freight Cars; Snow Sweepers; Locomotive Cranes; Rail and Rail Accessories; etc.

DULIEN STEEL PRODUCTS, INC.

414 First Avenue South Seattle, Washington

PORTLAND • LOS ANGELES • SAN FRANCISCO • BUTTE • NEW ORLEANS • NEW YORK

ROTARY CONVERTERS

500 KW WEST. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM. Pedestal type, 2300/4000 V. Transformers.
300 KW G.E. SYN. 275 V. HCC. 6 Ph., 60 Cy., 1200 RPM. form P. 2300-4000 V. Transformers.
200 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal type, 2300/4000 V. Transformers.
150 KW G.E. SYN. 275 V. HCC. 6 Ph., 60 Cy., 1200 RPM. form P. 2300/4000 V. Transformers.
150 KW WEST. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM. 2300/4000 V. Transformers.

MOTOR GENERATORS

300 KW G.E. SYN., 275 V., 2300/4000 V. 3 Ph., 60 Cy., 720 RPM, 80% P.F. Manual Switchgear.
250 KW G.E. SYN., 275 V., 2300/4000 V. 3 Ph., 60 Cy., 720 RPM, 80% P.F. Manual Switchgear.
200 KW G.E. IND., 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM. Manual Switchgear.
200 KW R.W. SYN., 275 V., 2300/4000 V., 3 Ph., 60 Cy., 900 RPM, 80% P.F. Manual Switchgear.

LOCOMOTIVES

10-T WESTGHE, 250 V., 907-C Mts., 36"-44" Ga.
10-T WESTGHE, 500 V., 907-C Mts., 36"-44" Ga.
10-T WESTGHE, 250 V., 917-C Mts., 36"-44" Ga.
10-T WESTGHE, 500 V., 917-C Mts., 36"-44" Ga.
4-T JEFFREY, 250 V., MH-85 Mts., 24"-36" Ga.
8-T WESTGHE, 250 V., 906-C Mts., 36"-44" Ga.
8-T WESTGHE, 500 V., 906-C Mts., 36"-44" Ga.
6-T JEFFREY, 250 V., MH-88 Mts., 36"-42" Ga.
6-T JEFFREY, 500 V., MH-88 Mts., 36"-42" Ga.
6-T WESTGHE, 250 V., 904-C Mts., 36"-42" Ga.
3-T WESTGHE, 250 V., 902-B Mts., 36"-42" Ga.
4-T WESTGHE, 250 V., 902-C Mts., 36" G.
4-T GOODMAN, 250 V., 42-I Mts., 40"-44" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

WALLACE E. KIRK COMPANY

Incorporated

501 Grant Building Pittsburgh, Pa.

LOCOMOTIVE

1—American 41 ton, standard gauge, saddle tank, cylinders 14 x 22, steam brakes.

ROLL CRUSHER

1—Link Belt 24 x 24 single roll coal Crusher, new condition.

DRYER

1—Vulcan 7' x 55' single shell Dryer.

A. J. O'NEILL
Lansdowne Theatre Bldg.

LANSDOWNE, PA.

Philadelphia Phone: Madison 8300

★ MINING EQUIPMENT READY FOR DELIVERY ★

GENERATORS

150-KW G. E. M-G set, 500 volt
150-KW Steam plant, 250 volt
100-KW Ridgway M-G set, 250 volt
90-KW West. M-G set, 250 volt

LOCOMOTIVES

2—13-Ton Goodman, 250 volt, 48" Gage
1—8-Ton West. 65, 250 volt, 42" Gage
6—Ton West. 904-C, 250 & 500 volt, 42 & 44" Gage
1—6-Ton G.E. 823, 250 volt, 44" Gage

Many other items in stock. Let us know your needs—We buy, sell and trade.

ALL-STATE EQUIPMENT CO., Inc.

LOGAN, W. VA. PHONE 884

CUTTING MACHINES

1—12-CA Goodman, 250 volt
2—12-AA Goodman, 250 volt
CE-7 Sullivans, 250, 500 & 220 volt
16—12-G3 Goodman, 220 volt A. C. Motors
6—212-G3 Goodman, 220-440 volt. A.C. motors

MISCELLANEOUS

31½x36" Scotdale Double roll coal crusher
4—Track coal tippie complete with all machinery, motors and magnetic starters just as released from service. First class condition.
D.C. Motors ¼ to 50-HP.
A.C. Motors 1 to 280-HP.



SEARCHLIGHT SECTION



6 YD. STRIPPER SHOVEL

200-B Bucyrus 6 years old. 75 ft. Boom, 60 ft. Dipper stick, 6 yd. Dipper Steam Shovel.

LIGHT PLANT

4 KW Kohler 120 V—Gasoline Lighting Plant.

DIESEL DRAGLINES

3W 4W & 5W Monighan Walkers, 90 to 110 ft. booms.

3 Yd. P&H. 800, 97' boom.

2½ Yd. 48B Bucyrus 80' boom.

2 Yd. 750 Lima. 60' boom.

AIR COMPRESSORS:

(7) Steam 66 ft., 300 ft., 600, 1000 & 1940 ft.

(12) Belted, 350, 676, 870, 10000, 1300 ft.

(12) Diesel 105, 315, 520, 676 & 1000 ft.

(6) Electric, 1300, 1500, 2200, 2600, 5000 ft.

(14) Gasoline, 110, 160, 220, 310 & 370 ft.

COAL CRUSHERS:

Jeffrey Single Roll 18x18, 24x24 & 30x30

Link Belt 26x24 Double Roll Crusher

HYDRAULIC CARWHEEL PRESSES:

100 Ton, 150 Ton, 200 Ton, 300 & 400 Ton Caldwell - Niles - Wood - Watson Stillman

RUBBER CONVEYOR BELTS:

1000' 60", 600' 30", 300' 20", 1800' 42", 900' 48", 1450' 36", 1200' 24", 900' 18", 600' 16", 350' 14".

CONVEYOR PARTS:

Idlers, Heads & Tail Pulleys, Steel Frames, Tripper, etc., 14 in., 60 in. Large Stock here.

SYNC. MOTOR GENERATORS & ROTARYS:

100 KW Ridgway 1200 RPM 3/60/2300/250-275

150 KW G.E. 1200 RPM 3/60/2200-250-275

200 KW Ridgway 900 RPM 3/60/2200-250-275

3-100 KW G.E. 275 v. 1200 RPM Rotarys

STORAGE BATTERY LOCOMOTIVES:

2½ ton Whitcomb 24 ga. New Batteries

2-4 ton G.E. 30 in. ga.

3-5 ton Mancha 30 in. ga.

4-5 ton G.E. 36 in. ga.

3-7 ton Goodman 36 ga. Battery & Trolley

8-6 ton Baldwin Westgh. 42 ga. & 36 ga.

TROLLEY LOCOMOTIVES:

2½ ton Westinghouse 24 ga.

4-6 ton & 3-5 ton Goodman, 36 ga.

3-6 ton Goodman 30 ga.

4-6 ton Goodman 42 ga.

5-6 ton Westinghouse 42 ga.

2-8 ton Goodman 36 ga.

10 ton Goodman 42 ga. & 13 ton Jeffrey

VIBRATING SCREENS:

9 Tyler Hummer 3x6, 4x5, 4x8 & 4x10

2 Robins Gyrex 4x8½

4x12 Niagara, 3x8 L. B., 5x8 Simplex

CARS:

120-4 ton 42 ga. S.D. Mine Cars

60-Western 16-20-30 yd. Side Dump

SHOVELS, CRANES & DRAGLINES:

3 W 90' Boom, 6 & 160' Boom, Model 6150, 175'

Boom, Diesel, Monighan Walkers

1 yd. K 30 Link Belt 50' Boom Crane

2 yd. Page 76' Boom Diesel Dragline

1½ yd. Marion 450 Elec. Shovel

1½ yd. Lima Diesel Shovel & Dragline

2 yd. Link Belt Elec. Shovel & Dragline

25 ton Browning 50' Boom Loco. Crane

7 Conway 20A, 30A, 50A, 60 & 75 Muckers

MINE LOADERS:

Junior Joy 36 ga. Low Pan

Conway 20 Mucker

3-5 BU & 7 BU 36 or 42 ga. Joy

9-Goodman 200 & Jeffrey 441

MISCELLANEOUS:

5x160' Traylor Rotary Dryer

100 HP G.E., 3/60/440 v.-900 RPM Elec. Motor

6-Goodman 12CA & 12DA 6 ft. Cutters

9x8 Sullivan Mine Compressors

Clamshell Buckets ¾, 1 1½ & 2 yd. Cap.

30 ton & 12 ton Vulcan Std. Ga. Gas. Loco.

WANTED TO BUY:

Complete Mines—M.G. Sets, Locomotives, Com-

pressors, Conveyors, Cranes, Crushers & Rotary

Converters. Also Rails, Screens, Pumps, Cars,

Mine Loaders & Mining Machines.

Tidewater Equip. & Machy. Corp.

305 Madison Ave. New York, N. Y.

FOR SALE

1—Model 125 Marion Electric Dragline, 110' boom, 4 yard bucket, 2300 volts, 3 phase, 60 cycles.

1—75A Lorain 1½ yard gas shovel.

1—Model 600A 1 yard P & H Combination gas shovel with 50' dragline boom and 1 yard Page drag bucket

1—Model 480 Marion 2 yard steam shovel.

1—Lima 601 1½ yard shovel front.

1—4 yard Medium weight Bucyrus-Erie dragline bucket.

Frank Swabb Equipment Company

Hazleton, Pa. Telephone 3906

FOR SALE

JOY LOADING MACHINES

15—5-BU Joy Loading Machines, 250 volt. Just taken out of service and in excellent condition. Have been loading 450-ton of coal per shift.

STEEL MINE CARS

100—2½-ton, 42" gauge, rotary dump mine cars in perfect operating condition. Height overall 38", length 122", width 61½", length of body 98", 90 cu. ft. level full, 16" Timken Bearing Wheels, link and pin couplers, 4-wheel brakes, equipped with car haul bracket on bottom, Toncan Copper Bearing Steel used in sides and ends.

SHORTWALL MINING MACHINES

15—Jeffrey 35-A, 50 H.P., 250 volt DC, 7½' cutter bars.

7—Sullivan CE-7 AC Shortwall Mining Machines, 7½' cutter bars, self-propelled trucks and cable reels.

LOCOMOTIVES

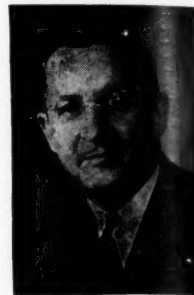
4—Goodman 15-ton Tandem Locomotives, type 132-O-4-T, 250 volt ball bearing motors. Equipped with equalizers and contactor control. Completely rebuilt. 42" and 44" gauge.

25—6, 8, 10 and 15-ton completely rebuilt Jeffrey, Goodman General Electric and Westinghouse Locomotives. 36" to 48" gauge.

MISCELLANEOUS

Steel Tipples, Electric Hoists, Motor Generator Sets and Rotary Converters, all sizes.

We Specialize in Buying Complete Mines That are Going Out of Business or From Receivers in Bankruptcy, Administrators of Estates, Etc.



Frank J. Wolfe

COAL MINE EQUIPMENT SALES COMPANY

306-7 Beasley Building L. D. Phone-34 Terre Haute, Indiana

LINK-BELT UNLOADING TOWER

SUITABLE FOR COAL OR ORE

GANTRY TYPE • CAPACITY 750 T.P.H.

RAIL SPAN 44' • OVERALL HEIGHT 114' WIDTH 166' COMPLETE WITH WIRING AND 8 SELF-CONTAINED 3 PHASE MOTORS AND BUCKET

ERMAN-HOWELL & CO., INC.

332 S. MICHIGAN AVE.

CHICAGO, ILL.

PIPE-MACHINERY-GAS ENGINES

AIR COMPRESSORS-DIESELS-PUMPS

Some Steam Engines and Boilers available only slightly above the metal price

BRADFORD SUPPLY COMPANY

WAYNE, WOOD COUNTY, OHIO

Near Toledo

MINING MACHINES

Goodman Standard & Universal.

AC & DC Rebuilt & Guaranteed.

MINE LOCOMOTIVES

5 to 20 ton.

STRIPPING SHOVELS

M. G. SETS & ROTARY

CONVERTERS

PUMPS and FANS

COAL CRUSHERS

Coal hopper with weigh pan and scale

Hydraulic Wheel Presses

Will buy, sell or exchange.

What do you need?

The Industrial Equipment Corp.

Warehouse: Carnegie, Pa.

P. O. Box 1647

Pittsburgh, Pa.

IRON and STEEL PIPE

New and Used

Large stocks, all sizes attractive prices

L. B. FOSTER COMPANY, Inc.

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Pittsburgh, Pa.

New and Guaranteed Tested Reconditioned

STEEL PIPE AND BOILER TUBES

In Light Weight, Standard or Heavy

Jos. Greenspon's Son Pipe Corp.

NAT'L STOCK YDS (ST CLAIR CO) ILL.

150 Ton-Caldwell Hydraulic Wheel Press

38" between Tie Bars

2 Plunger Pump

First Class Condition

ARTHUR S. PARTRIDGE 415 Pine, St. Louis

Prompt Shipment From Our Warehouse

MINING MACHINES

- 9-12 G3 Goodman 220/3/60 AC 6' Bar.
- 9-12 AB Goodman 250 V. DC 6' Bar.
- 9-35 B. Jeffrey 250 v. 6' Bar #18972 with Bowditch Chain and #11416, both with cables.

LOCOMOTIVES (Battery)

- 5 Ton Jeffrey storage battery 42 to 44" Ga.
- 5 Ton Ironon Type E2, 36" Ga.
- 4 Ton Jeffrey 44" Ga.

(Haulage)

- 13 Ton Jeffrey 250 V. 40" 42" Ga. M.H. 110 Motors.
- 8 Ton Westgh. 250 V. 36" Ga.
- 6 Ton Whitcomb 250 V. 40/42" Ga.

MG SETS 3 ph. 60 cy. (Syn.)

- 150 KW Ridgway 250 V. DC 2200 V. AC 900 RPM.
- 150 KW West. 550 V. DC 2200 V. AC 1200 RPM.
- 100 KW G.E. 550 V. DC 2200/3/60 AC 900 RPM.
- 90 KW Al.Ch. 250 V. DC 2200 V. AC 900 RPM.

ROTARY CONVERTERS

- 1-150 KW HCC-6 Gen'l Elec. 275 v. 1200 RPM with switchboards and Transformers 2300 or 4000 v. 3 ph. 60 cy.
- 1-500 KW HCB Gen'l Elec. 275 v. with switchboards and Trans. 6600 or 3800 v. 3 ph. 60 cy.
- 165-KW G.E. Type HCC 6-250/125 v. 1200 RPM with 3-75 KVA G.E. Trans. 2300/400 v.

SYN. MOTORS 3 ph. 60 cy.

HP	Make	V.	Speed
350	Al. Ch.	2200	600

HIGH TORQUE WOUND ROTOR MOTORS (Wound Rotors)

HP	Make	V.	Speed
200 (5)	G.E.	2200	600
150 (4)	G.E.	2200	600
125 (1)	G.E.	2200	600

SLIP RING & SQ. CG MOTORS (3 ph. 60 cy.)

HP	Make	Speed	Wdg.	Type
700	G.E.	393	S.R.	MT 432
400	West.	500	S.C.	CS
300	G.E.	600	S.R.	IM
200	G.E.	250	S.R.	MT 412
200	Al. Ch.	600	S.C.	
150	G.E.	720	S.R.	IM
150	West.	580	S.C.	CCL
150	G.E.	600	S.R.	IM
125	Al. Ch.	435	S.R.	
100	G.E.	500	S.R.	MI-25 cy.
100	Al. Ch.	900	S.C.	
75	G.E.	865	S.C.	KT

HOISTS

- 75 HP Lidgerwood sgl. fr. drum
- 50 HP Diamond 2 drums same Shaft
- 30 HP Clyde sgl. drum AC Motor
- 15 HP Lidgerwood sgl. dr. AC Motor

400 TRANSFORMERS (Westgh. & GE 1 ph.)

Qu.	KVA	Pri. V.	Sec. V.
3	1	2080/2200	115/230
5	2	"	"
100	5	"	"
82	7 1/2	"	"
71	10	"	"
1	30	"	"
3	37 Rotary	4400/185	
3	50	2300	230/460
1	100	3 Phase	
1	150		230/460

ENGINE GENERATOR SETS

- 100 KW 250 v. DC Westgh.—Skinner Engine
- 25 KW 125 v. Sturtevant—40 HP Turbine.

D. C. MOTORS

- 1 to 125 HP, all speeds.

MOORHEAD-REITMEYER CO., INC.
PITTSBURGH, PENNSYLVANIA

IMMEDIATE DELIVERY POWER SHOVEL—

80-B Revolving shovel, electric driven, 2-yard BUCYRUS-ERIE with AC current., 60 cycle, 440 vol, 3 phase.

Boom 48' long. Dipper handle 32' long. Dipper 2 cu. yd. with Manganese steel dipper teeth.

Shovel mounted on trucks. Arrangement one—4 wheel equalizing type truck of heavy design under each corner of base four double flanged wheels which are all drivers.

For inspection contact

BRIGGS & TURIVAS, INC.
139th & Western Avenue Blue Island, Ill.
Phone Blue Island 2700
Phone Commodore 1420—Chicago Exchange

TRANSFORMERS

Single Phase—60 Cycle

- 3-150 KVA Pgh. 2200/220/440 V.
- 2-150 KVA Pgh. 6600/220/440 V.
- 1-125 KVA Pgh. 6600/220/440 V.
- 3-100 KVA G.E. 6600—13,200 V H.T. 2200 V.
- 3-100 KVA G.E. 2200 V. H.T. 440/220/110 V.
- 2-75 KVA West. 2200/110/220 V.
- 2-75 KVA West. 6600/220/440 V.
- 1-50 KVA Pgh. 2200/220/440 V.
- 2-37 1/2 KVA Pgh. 2200/220/440 V.

A. C. MOTORS—3 Phase—60 Cycle

- 1-185 HP Burke Sq. Cg. 2200 V. 1150 RPM.
- 1-150 HP G. E. Type I, Form M, 440 V. 690 RPM.
- 1-150 HP West. Type CW, 2200 V. 580 RPM.
- 1-100 HP G. E. Type KT, Sq. Cg. 2200 V. 1800 RPM.
- 1-30 HP G.E. Type KT, Sq. Cg. 220 V. 1200 RPM.
- 1-15 HP G. E. Sq. Cg. 440 V. 1800 RPM.
- 1-7 1/2 HP G. E. Type I, Form M, Slip Ring, 850 RPM.

D. C. MOTORS—230 Volt

- 1-60 HP G. E. Series Wound, Type CO, Frame No. 2007, 500 RPM.
- 1-30 HP G. E. Type RC, 1150 RPM.
- 1-25 HP West. Type HK, series wd. 600 RPM
- 1-20 HP G.E. Type CD, 1200 RPM.
- 1-10 HP West. Type SK, 850 RPM.
- 1-10 HP West. Type S, 1325 RPM.
- 1-7 1/2 HP G. E. Type CY-23, Crab Reel Motor.
- 1-5 1/2 HP West. Type SK, Frame No. 70, 800 RPM total enclosed.
- 1-5 1/2 HP West. Type HK, Frame No. 2, 850 RPM.
- 1-5 HP G.E. Type MC, 1150 RPM.

MINE LOCOMOTIVES

- 1-6 ton G. E. with HM 819—250 V motors.
- 2-5 ton G. E. with HM 825 motors and reels.

CUTTING MACHINES

- 1-12AB Goodman 250 V Shortwall.
- 1-29B Jeffrey Arewall.
- 1-12G3 Goodman AC Shortwall.
- 4-35B Jeffrey Shortwalls.
- 1-Sullivan Bit Sharpener.
- 1-36 x 36 single roll coal crusher.

TIPPINS MACHINERY COMPANY
3530 Forbes St. Pittsburgh, Pa.

NEW RUBBER CONVEYOR and TRANSMISSION BELTING

CONVEYOR BELTING ABRASIVE RESISTANT COVERS				TRANSMISSION BELTING HEAVY-DUTY FRICTION SURFACE				ENDLESS "V" BELTS			
Width	Ply	Top-Bottom	Covers	Width Ply	Width Ply	Width Ply		"A" — WIDTH	All Sizes	"B" — WIDTH	All Sizes
48"	8	1/8"	1/16"	18"	6	10"	6	6"	5	"C" — WIDTH	All Sizes
42"	5	1/8"	1/16"	16"	6	10"	5	5"	5	"D" — WIDTH	All Sizes
36"	6	1/8"	1/16"	14"	6	8"	6	4"	5	"E" — WIDTH	All Sizes
30"	6	1/8"	1/16"	12"	6	8"	5	4"	4	Sold in Matched Sets	
30"	5	1/8"	1/16"	12"	5	6"	6	3"	4		
24"	5	1/8"	1/32"	ELEVATOR BELTING							
24"	4	1/8"	1/32"	HEAVY DUTY RUBBER COVERED							
20"	5	1/8"	1/32"	Width Ply	Top-Bottom	Covers				RUBBER HOSE	
20"	4	1/8"	1/32"	12"	6	1/16"	1/16"			ALL SIZES FOR	
18"	4	1/8"	1/32"	14"	6	1/16"	1/16"			AIR — WATER —	
16"	4	1/8"	1/32"	16"	6	1/16"	1/16"			STEAM — SUCTION —	
14"	4	1/16"	1/32"	18"	6	1/16"	1/16"			FIRE — WELDING	
12"	4	1/16"	1/32"	18"	6	1/16"	1/16"			ETC.	

Inquire For Prices —: Mention Size and Lengths

CARLYLE RUBBER CO., Inc.
66 PARK PLACE New York, N. Y.

MINE HOISTS

- 1-Diamond 12" Drum 20 HP electrical equipment.
- 1-Vulcan 30" Band Friction with 50 HP electrical equipment.
- 1-Connellsville 54" Drum Haulage Hoist with 100 HP electrical equipment.
- 1-Lidgerwood 42" Drum with 150 HP electrical equipment.
- 1-Lidgerwood Cylindro-Conical Drum 200-1 1/4 with 350 HP electrical equipment.

And other hoists to suit all mining conditions

Jones Mining Equipment Co.
541 Wood Street Pittsburgh, Pa.



SEARCHLIGHT SECTION



LOCOMOTIVES

Goodman: All 250 volts,

- 1—10 ton, 31-1-4-T.
- 1—6 ton, 20B, 48" 1—5 ton.
- 1—5 ton, W-1-2, 36"

Westinghouse: All 250 volt.

- 1—4 ton, 902, 48" 1—18-ton, 102, 42"
- 1—904 c. 44" 500 volt. Also 906 motors.
- 1—10 ton, 915

G.E.: All 250 volt, 5 ton 825, 44"
6 ton 803, 44", as is 4 ton 1022, 41, as is
6 ton 823, 44" 8 ton 839 motors.

Jeffrey: 6 ton, and 4 ton, all gauges, 250 volt
2—Jeffrey MH 110 Locomotives

MINING MACHINES

Jeffrey, 35B, 29B, and 4—28A, 250 V. 2—
29C with drop bar support.

Goodman, 12A, 12AB, 12AA, 12G3A, 34B.
1—12G3 250 volt and 2—112 DA, 500 volt.
2—Permissible Type 12CA. 10—112AA

Sullivan, CE7, CE9, CE10, CR10 Low Vein

SUBSTATIONS—275 volts, D. C.

- 2—200 KW GE Rotaries (600 volt)
- 1—200 KW Ridgway M.G. Set.
- 1—200 KW G.E. Rotary Converter.
- 1—150 KW West. Rotary.
- 2—150 KW, 2—100 K Ridgeway M-G Sets.
- 1—150 KW Ridgeway Rotary
- 1—150 KW West. Rotary converter.

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volt, 1 Clam shell bucket 1 1/4 cubic yard, 1—Figure 8 drum, Coal Crushers—18x16—24x24 and 30x30.

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FOR SALE BOILERS, ENGINES and MINING EQUIPMENT

2—150 Kilowatt Ridgway Steam Engine Generator
Sets, 1—200 Kilowatt Steam Generator Set, 2—
Double Horizontal Danville Hoisting Engines, 6'
drum, 125# steam pressure, 5 Boilers, 150 HP,
size 72"x18", 125# steam pressure, Coal Crusher,
size 48x36, capacity 200 tons per hour, 1 Jeffrey
Arcwall Cutting Machine 29-C, serial #16238,
1 Jeffrey 44-D Loading Machine, 2 Jeffrey 6-ton
locomotives, type 288, 1 Goodman 10-ton loco-
motive, type 35-B, serial #2274, for 42" track
gauge, 2—3-track wood tipples, 1500 and 500 tons
daily capacity, 2 Loading Booms, 48" wide, 30'
long, 1 Apron Conveyor, 48" wide, 30' long, 1
Picking Table and Loading Boom, 60"x47", 1 Pick-
ing Table and Loading Boom, 48"x56", 1 mine
car scale.

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GLOUSTER OHIO

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MOTOR GEN. SETS
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3—One **POMONA** Vertical Pump, 75 h.p.,
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motor, together with starting com-
pensator, capacity 1000 gal. per min.,
200 feet head.

4—One **ALLIS CHALMERS** Pump, type
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received by February 26th will
appear in March issue, subject to
space limitations.

Departmental Staff

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SQUIRREL CAGE 220/440 VOLTS

1— HP GE IE 15K	1200
1—200 HP WEM CS	1200
1—100 HP GE KT	900
1—100 HP Allis	900
3—150 HP GE IK	1200
1—150 HP WEM CS	1200
1— 75 HP WEM CS	580
1— 75 HP GE IK	690
1— 75 HP GE IK	600
1— 50 HP WEM CS	345
100	700
1— 50 HP GE IK, 3 bearing	490
3— 50 HP GE IK	1200
2— 75 HP GE IK	1200
1— 75 HP WSM CS	1200
1— 40 HP GE KT	1200
1— 40 HP GE KT	690
1— 40 HP WEM CS	1160

SQUIRREL CAGE 2300 VOLTS

1—200 HP GE I-K	1800
1— 75 HP Allis	1800
1—150 HP GE I-K	720
2— 50 HP GE KT	600
1— 40 HP GE KT	1200
1— 40 HP Electro Dyn.	1800
1— 30 HP F. B. Morse	1200
1— 75 HP GE KT	600
1— 60 HP GE IQ 2 ph.	690
2—300 HP GE IE	1800

NEW 230 VOLTS SK

1—30 HP SK 93	1750 CP
1—20 HP SK 100-L	900 CP
2—25 HP SK 100-L	1150 CP
1—20 HP SK 93	1150 CP
1—10 HP SK 60-L	1150 CP

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- 1—Goyne Pump Co. 12" volute acid resisting bronze 1200 RPM, 6000 GPM, 205 ft. head on base, ready to receive driver.
- 1—Scranton, 6" two stage acid resisting bronze 1200 GPM, 160 ft. head, 1200 RPM. on base, ready to receive driver.
- 1—Barrett-Haentjens C.I. bronze fitted, 850 GPM, 210 ft. head, 1750 RPM, with 40 H.P. Westinghouse CS, 440 V, 60 cycle, 3 phase, squirrel cage motor.
- 1—Worthington, 4" C.I. bronze fitted, 600 GPM, 186 ft. head, with 50 H.P. G.E. KT., 440 volts, 60 cycle, 3 phase, 1750 RPM.

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- 1—Motor-Operated Brush Raising Mechanism for Rotary Converter.
- 3—165 KVA, 6600-445 volt G.E. Rotary Converter Transformers.
- 3—100 KVA, 2300 volt, G.E. Rotary Converter Transformers.
- 3—55 KVA, 2300/4000Y, G.E. Rotary Transformers.
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- 3—Oxide Film Lightning Arrestors.

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- 200 KW, 600 V. Motor Generator Set synch. motor, 3/60/2200
- 1000 KW Turbine Type G.E. Generator 3/60/2300, 3600 RPM
- 500 KW G.E. Skinner Uniflow Steam Engine Generator, 250 V. D. C.
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20"-24"-30"-36"

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1855



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REDUCES SUCH ACCIDENTS

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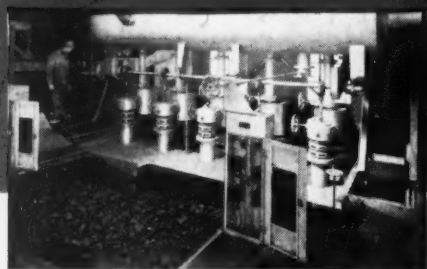


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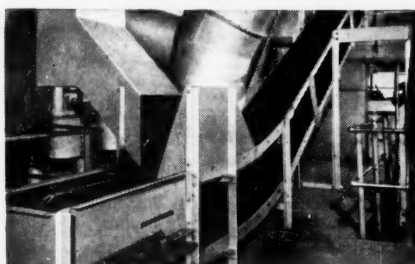
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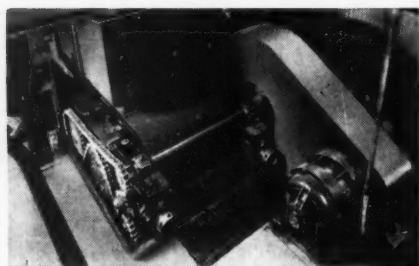
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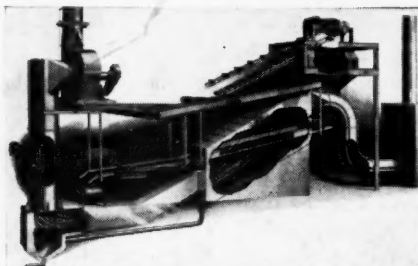
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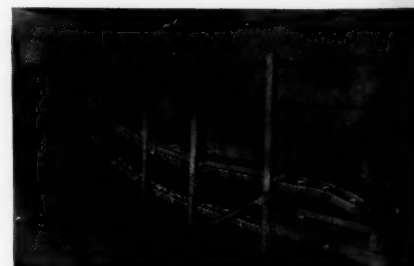
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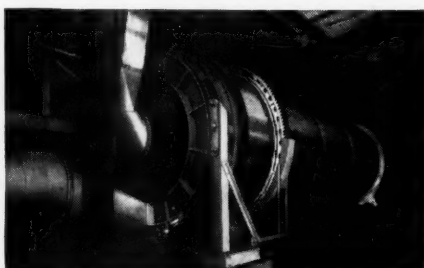
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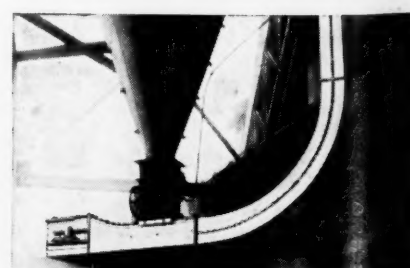
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